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JUNE'S THEME:

World Class Technical Capabilities

DWIGHT'S NOTES

Our theme this month, World Class Technical Capabilities, is especially important to the Corps of Engineers at this point in our history. For the last decade or so the federal government, in general, has evolved into a set of granting or regulatory agencies largely dependent on others for technical capability. Some agencies have thrived on this model and are delivering the public first class service. Some others have allowed their technical capabilities to erode to the point where they can no longer perform their inherently governmental responsibilities, leaving the public to suffer. The Corps is caught up in the ongoing debate over the appropriate role of the federal government and the part we should play within it. The new Administration is sending signals that the role of the federal government needs future curtailment. Throughout this debate we've received and sent mixed signals regarding the Corps identity and requisite workforce capabilities.

General Flowers has clarified matters for us in the Strategic Vision and Campaign Plan. The Chief's emphasis on public service and on technical and professional excellence defines the reputation we hold dear. I serve on the "People" committee that helped shape the Vision and Campaign Plan under the Chief's watchful eye. We are attempting now to provide the leadership and incentives for Corps employees to truly be "trained and ready" to serve the Army and the Nation throughout the "full spectrum of USACE operations". MSC Commanders and Regional Business Centers are actively engaged in top to bottom "capable workforce" evaluations (see "E&C News" February 2001 issue). We've recently completed assessments for Civil Works Planning and for Hydraulics and Hydrology functional areas. We're the midst of an equally comprehensive review of the Corps Construction capabilities. Late August HQ will be briefed on the findings and recommendations of a first class Dam Safety Peer Review effort.

Early indications are that we have been able to maintain highly skilled technical talent, but in lesser numbers and with greater reliance on the private sector. We've found some pockets of world-class capabilities, steady erosion in some others, and glaring holes in a few. Meanwhile, the people we serve demand more, not less, professional service delivered responsively and consistently. We've kept up with demand, so far, in my estimation; because we've embraced the tenets of teamwork, project management, and regional business centers. We're leveraging and sharing knowledge better than before. Yet, we can only stretch so far.

This month, the Department of Defense submitted its FY02 budget. The budget included over \$1 Billion increase in military construction to be executed by the Corps. All indications point toward the Congress restoring funding levels in the Civil Works program to FY01 levels in place of the 14% cut budgeted by the Administration. Domestic and international partners alike seek our unique civil works

DWIGHT'S NOTES (CONTINUED)

and environmental engineering capability with increased frequency. Coincidentally, the Administration and the Congress struggle to increase the investment in public infrastructure, the condition of which the American Society of Civil Engineers "grades" no better than D+. There is no shortage of requirements for a "world premier public engineering organization." Can we continue to answer the call?

Now is the time to build the technical capabilities to meet the engineering challenges of tomorrow. Now is the time to redouble our efforts to recruit, train, and retain world-class talent. Now is the time to invest in our people by providing challenging work, educational opportunities, a learning environment, and visible evidence of the difference they make in the lives of soldiers and citizens. Now is the time to live the Army Values: Loyalty, Duty, Respect, Selfless Service, Honor, Integrity, and Personal Courage... public service personified.

We've been empowered, are indeed expected, to follow this course. Let's say we'll "DO IT".

Essays,

Dwight

(Editors' note: If you want to share your thoughts with our readers regarding Dwight's Notes send an email to the E&C News editor (charles.pearre@usace.army.mil). A synopsis of your comments will be published in the next issue.)

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World Class Technical Capabilities

WORLD CLASS

Definitions are World Class vary with the organization that making the presentation. Generally the definition of World Class Status includes providing the availability and utilization of resources and increasing quality and responsiveness of services to meet world competition. It is an illusive definition. I searched the Internet for some examples.

Prentice-Hall has published a textbook entitled "Engineering Management: Creating and Managing World Class Operations", by W. Dale Compton from Purdue University.

At dedication ceremonies for The University of Texas at Austin's new Applied Computational Engineering and Sciences (ACES) building, the building was billed as a world-class setting for interdisciplinary research and graduate study in computer sciences, electrical and computer

engineering, and computational and applied mathematics. Featuring state-of-the-art equipment and systems, the 180,000-square-foot building offers a highly flexible infrastructure that can efficiently handle advances in technology.

North Carolina State University as a website titled World Class Manufacturing Research Team. They open with the statement "The **World Class Manufacturing Research Team (WCMRT)** conducts research projects in the areas of manufacturing strategy, strategic planning, quality engineering, continuous quality improvement, concurrent engineering, computer integrated manufacturing, process improvement, maintenance management, process mapping, employee involvement, high performance teams, change management, facilities design, activity based costing, concurrent design of products and processes, and simulation".

NST/Engineering, Inc. offers World Class safety training.

The Air Force Management Engineering Agency's "innovative and stellar" practices in strategic planning was one of the "best in class" in a study conducted by IBC and the Educational Testing Service that markets the Scholastic Aptitude Test.

Classic Industries, Inc. states on their homepage: "For over 25 years, Classic Industries, Inc., has been providing World Class Engineering and Injection Molding Services. We currently have four Clean Room Manufacturing facilities located in Southwestern PA and El Paso, TX. Each, provide a reliable supply of components to our medical partners. Our experienced engineering staff is dedicated to providing our customers with new product design, development, and project management as well as speed to market. The company is poised for rapid but controlled growth."

The Corps of Engineers Vision Statement defines the Corps as a World-Class organization.

"The world's premier public engineering organization responding to our nation's needs in peace and war. A full spectrum Engineer Force of high quality, dedicated soldiers and civilians:

- Trained and ready
- A vital part of the Army
- Dedicated to public service
- An Army values-based organization"

Instead of going into a long discussion in the theme article about the Corps position as a World-Class organization, this issue provides seven articles from Corps Districts that show World Class technical capabilities.

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MONROE FOLDING FLOODWALL

In the mid-1930's, earthen levees and a concrete floodwall were constructed along the Ouachita River to protect Monroe, Louisiana from seasonal flooding. Right-of-way problems left a 1750-foot gap in the floodwall fronting the downtown area. Until the 1970's, an unsightly temporary earthen levee was erected on top of a major street along the river to fill this gap during flood crisis.

In conjunction with the Urban Renewal Project in the early 1970's, the city requested the Corps devise some form of flood protection that could be easily lowered to allow an unobstructed view of the river during the low water season.

The resulting structure, the first known folding floodwall within the Corps, was constructed in 1977 and consists of 144 precast panels capable of folding down to the landside to form a pedestrian walkway. Struts connected to the landside base support each panel. When the wall is not in use, its appurtenances can be stored under the walkway created by folding the vertical wall to its horizontal position making the appurtenances available and easily accessible at all times.



The folding floodwall consists of a cantilevered I-type sheet pile wall with a concrete base. The vertical stem of the wall is comprised of concrete panels hinged to the base. When the wall stem is in the raised position, steel pipe struts anchored to the base support it. Seals and channel seal plates are bolted together through the vertical joints to make them watertight.

The folding floodwall has been erected four times since it was completed in 1977 in

anticipation of flooding with water actually reaching the floodwall once in 1991. John Stringer, Executive Director of the Tensas Basin Levee District whose organization maintains and operates the floodwall, expressed great satisfaction with the usefulness and aesthetics of the folding floodwall. His workers use an 18-ton crane to totally erect the floodwall in two days. A ten-foot minimum width lane is required on the landside of the folding wall to allow for operation and maintenance of the crane.



The folding floodway answers all the challenges made by the city of Monroe by providing the necessary protection from flooding along the Ouachita River and during low water times, preserves and enhances the beauty of the riverfront in the downtown area.

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PROTECTIVE DESIGN CENTER - AN ANSWER TO A PRIVATE WAR

USS Cole... Oklahoma City... Khobar Towers...Beirut barracks... World Trade Center... Kenya... Tanzania...

The names are familiar, and they pack the same emotional wallop for younger generations that Pearl Harbor did for their grandparents. But these were a different type of infamy. These were not acts of

open war, one government against another. These were individuals and private groups declaring a private war, using terror attacks against the unsuspecting for political gain.

The U.S. government is responding to the terrorism threat, and Omaha District is in the forefront of those efforts. The district's Protective Design Center (PDC) is the U.S. Army Corps of Engineers' resource for anti-terrorism and force protection engineering support. It is a Corps Center of Expertise.

PDC's work is in two mission areas - security engineering and hardened structures. The first deals with criminal and terrorist threats, the second with military weapons. The district's sister office in Huntsville handles electronic security systems.

War time, peacetime -- "Ours is the brick and mortar side of engineering," said Dan Sommer, PDC chief. The same physics of explosives apply whether the bomb comes from a terrorist or an aircraft. "Me hardened structure is a wartime mission, and the force protection is our peacetime mission."

"We write the manuals here for both worlds, so we can coordinate both," said Curt Betts, who does threat and vulnerability assessments and site surveys.

Hardened construction is usually massive concrete. In the past, such structures had no windows, only one door, and may have been underground.

"After Desert Storm-4 we know a target can be hit from anywhere," said Patrick Lindsey, Chief of Hardened Structures Section. "So we're looking at the effects of smaller conventional weapons on structures."

For the last two years, most of the need has been in anti-terrorism force protection, especially for existing conventional buildings like offices and barracks. That need is predicted to increase in the next 10 years, but it does not detract from another PDC specialty - expeditionary temporary structures for troops deployed to places like Bosnia and Kosovo.

To accomplish these tasks, PDC includes all building disciplines - structural, mechanical, electrical, civil, and architectural. "But in security engineering, a lot of times those disciplines seem to disappear because security is an overarching application," Sommer said. "The hardened structure side is obviously pretty serious structural engineering. When you get into anti-terrorism design for, say, car bombs, the two work hand-in-hand. You have security engineers who look at the standoff distances and how to protect windows from shattering. They work closely with structural engineers who look at the building to harden it against blast pressures from explosions."

Standoff distance is how near vehicles or individuals are allowed to come to a building. "In installations in the U.S., there's usually some standoff distance," said Betts. "The problems escalate outside the U.S. In Germany, for example, there isn't a lot of land, so often there's little standoff." Standoff is also a problem in densely populated areas like Japan and Korea.

Because DoD has an immense inventory of structures throughout the world, much of PDC's work is retrofitting existing buildings. "In response to a presidential directive, we're in a three-year program to survey all DoD installations," Sommer said. "In that program, there's about 200 surveys. We have one year under our belt, but we haven't done a third of the surveys yet because many of the requests came during the first year."

New construction -- PDC expertise is also applied to new construction. A Joint Chiefs of Staff committee developed criteria, like standoff distances, for a new DoD construction standard for anti-terrorism force protection. (Betts is co-chair.) An interim version has been in effect for a year; the final version will be released later this year. The new standards address new construction, existing construction, and expeditionary structures.

Those criteria impact the cost of construction. For example, decreasing standoff distance increases cost. "If there's a bomb really close, it's hard to make that building stand up," Betts said. "Move the bomb away, and the effect is less severe. That's when we talk about minimum standoff. Keep that bomb a minimum distance away, and you can design the building with minimal cost increase."

PDC also works with manufacturers to ensure materials meet criteria "We're always looking for things that are proven. Anything off the shelf is attractive if it's been tested," Betts said. "Unfortunately, a lot of times a manufacturer claims something works, but they have no real proof. Until it's actually been proven using standard testing techniques, we can't take it seriously. But that's part of what our testing program is doing. They're taking a lot of commercial products and testing them on structures to see how they work." Much of that work is done at the Engineering Research and Development Center labs.

Glass is a major hazard in any blast, and PDC works with research and development organizations to make office buildings perform better. "If a blast occurs, the majority of injuries (not deaths) occur because of glass," said Ed Conrath, who specializes in blast resistance. "If we can put in better glass and anchor it better at a nominal cost increase, we've gone a long way toward solving the injury problem."

Conrath spent a couple months in Israel testing glass. "They built a full-scale test structure out in the desert. We'd set up the different part of the test in this structure, whether we were testing a wall or a window or a column or whatever. I gathered data after the tests."

Technology transfer -- Technology transfer is another major part of PDC's mission. PDC staff consults, with all services, and calls also come from private firms that contract with the military. Betts estimated that about a quarter of each day is spent answering questions by phone or e-mail. To aid technology transfer, PDC is creating tools to help users understand information. "The complexity is so high, the average engineer just can't stay up with it all," Betts said. "So part of our process is boiling it down to a simple tool (a computer program, or a look-up chart, or something) that helps them make their decisions quickly and get on with the design."

"Our 14-pound manual for designing conventional systems is much nicer on a CD," Lindsey said. PDC has also put standard information into computer programs. Using an autodesigner, an engineer can select different explosives, weights, and types of munitions, then get an analysis that can be applied to a structure. (This product is still in progress.)

To also help DoD designers, PDC has set up a web site for the Blast Mitigation Action Group. The web site has commercial products that have been tested, with links to the manufacturers' web sites.

Tele-engineering is another new PDC tool. "Anybody in the field can talk to us by video conference rather than us jumping on a plane to go there," Betts said. "We try to be responsive in as many

different ways as possible, but we're stretched. So if we can do that without going there, it saves us time and reduces our customer's cost."

Interest in this information waned a little after the Beirut bombing in 1985, but the destruction of the Khobar Towers barracks created new priorities. "Since 1996, we've seen a lot more awareness and a lot more things done that weren't done before," Sommer said. "Structures are being built to standards even as we speak."

Training -- Interest has also grown in security engineering training. "We've taught this class since 1987," said Doug Wehring, Chief of the Security Engineering Section. "Before '96 we tried to have a mix of engineers and security people, but we had a problem getting engineering interest." But since 1996, engineering interest has grown. "We've had installation master planners, and other Army and DoD engineering interests. There's a huge interest, primarily because of top-down emphasis that force protection has received since Khobar Towers."

The minimum construction standards have also increased emphasis on learning about force protection. Four years ago, PDC taught six to eight classes a year. In 2000, there were 21 classes. Two to four classes are taught at Fort Belvoir, Virginia; the rest were taught throughout the world. Contractors are included because they must incorporate the standards into their designs.

"The success of all this is the teamwork between the different players in a project, including engineers, security people, and many others," Betts said. "That's why we teach our classes the way we do. It's imperative for Corps people to understand that they can never work in a vacuum. They have to consult with security people and other installation people."

That teamwork includes assessment. Installation personnel are part of the planning team to help PDC engineers understand their particular requirements. "We don't set the threat environment," Wehring said. "We approach it from the engineering perspective. They need to know what their threats are and what they want to protect. Do they have to worry about car bombs? We don't know; they have to tell us."

"Doug can help that local commander identify where money needs to be spent to improve force protection," Sommer said. "With that understanding, requirements can be set for projects, and money can be designated for them."

In the Field -- "One unique responsibility we have that other government agencies don't is the expeditionary requirement," Betts said. Compounds are sometimes in the middle of a field in places like Bosnia or Kosovo. "When we build a structure in Nebraska, the design is protective *just in case* someone attacks us. In Kosovo, you're potentially taking fire every night. One of the most important parts of our mission is to support troops in the field."

"Historically, the Corps' mission has been building fixed facilities, and it's only recently that we started to emphasize troop deployment," Betts said. "We determine what we think the threat will be and how we can mitigate it. One thing we looked at in Kosovo was mortars. We used the same basic principles we'd use for a fixed facility, but we use a lot more improvisation. We use things like lumber and sandbags and soil. Things you wouldn't use in an office building, but it works perfectly well in the middle of a wheat field."

Getting involved early helps identify issues early. Wehring received the Kosovo call at 4 a.m.- Betts found out when he walked in the office at 9 a.m. He was on a plane by 3 p.m. "Curt was standing in front of the task force commander less than 24 hours after they asked us to be there," Wehring said. "That's what it took for us to be effective; get there early and have an opportunity to affect the basic layout."

The time to get there may be minimal, but time spent in-country can be for extended periods. "We were supposed to be in Kosovo six days; we were there six weeks," Betts said. Betts also spent two months in Bosnia. Conrath spent three weeks in Bosnia and Croatia and a month in Albania. Other PDC team members have similar stories.

On-site work is a broad topic. The Bureau of Alcohol, Tobacco, and Firearms hired PDC to collect data after the Oklahoma City bombing. Conrath was on the UN inspector team in Iraq, and spent three months in Kuwait after the Gulf War to help with rebuilding.

Minimize travel -- Video teleconferencing will minimize some travel, and increase PDC availability to the other services. But there are times when the team must be on-site. They will continue to work throughout the world, whether it's office buildings and installations in the U.S., hospitals in Korea, dormitories in Greece, facilities in Kuwait or Saudi Arabia, or shelters in the Balkans.

For more information on the PDC, check out its web site, <http://pdcunx.mro.usace.army.mil>.

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WORKSHOP ON DESIGN OF NAVIGATION LOCKS

A number of our Engineering leaders were concerned about how to effectively maintain and train a workforce capable of providing the engineering design necessary to sustain the nation's inland waterways' system of navigation locks. How to combine the various levels of experience of the Corps' lock design engineers and provide an environment where they could learn from each other. Their solution was to conduct a workshop!

To address many of these issues, a workshop entitled "Current Trends in the Engineering Design and Evaluation of Navigation Locks Workshop" was held in Vicksburg, MS from 27-30 March 2001.

The Mississippi Valley Division (CEMVD) and the Great Lakes and Ohio River Division (CELRD), in conjunction with the Engineer Research and Development Center, sponsored the workshop as a means to maintain and enhance the technical capabilities relating to design of navigation locks within these divisions. Approximately 160 engineers from CEMVD, CELRD and their 13 Districts attended the workshop. In addition, engineers from the Mobile District and the Panama Canal Authority also attended the workshop. Subject matter experts from the Corps and industry made over 100 separate technical presentations during the three and one-half day workshop.

The idea for a workshop began simply. Initially, the plan was to have a workshop designed primarily for about 30 senior level as well as junior level hydraulic engineers who were (or would be) conducting various lock designs. As CEMVD and CELRD began discussing the proposal with their Districts, interest developed in expanding the workshop to include structural, geo-technical, and mechanical/electrical disciplines as well. Before long, the workshop had grown to a much larger scope and level of participation than anticipated. Clearly, a need had been identified.

The Corps, in particular within the CEMVD and CELRD regions, has numerous studies and projects involving design of new or replacement locks and rehabilitation of or modifications to existing locks. The workshop was designed to provide an overview of the methodology of navigation lock design and issues to be considered during the design and construction process as well as to review new methodologies and techniques. The workshop was developed to be appropriate for lock design engineers with varying levels of experience. Topics relating specifically to hydraulics, structural, geo-technical, and mechanical & electrical design were presented. In addition, related issues such as environmental, economics, procurement, construction methods and operation and maintenance were discussed. An intangible, but significant benefit derived from the workshop was the opportunity for the lock design professionals to network with peers from the districts and divisions represented.

A central theme of the workshop was to promote communication and teamwork between the various design disciplines and Product Delivery Teams (including the final customers and the construction and operations offices). The workshop began with a one day General Session with all attendees. Issues of common interest to all design disciplines were presented by various speakers and discussed. The presentations covered items such as environmental and economic considerations during the evaluation and design phases and how they relate to the efforts of the various design disciplines. Days two and three of the workshop consisted of individual sessions for the hydraulic, structural, geo-technical, and mechanical/electrical design engineers. These sessions concentrated on current guidance and past design practices as well as on recent innovations in design and construction of navigation locks such as innovative lock filling and emptying systems, design of floating approach walls and in-the-wet construction using float-in construction techniques. Even though the individual sessions were tailored to the specific design disciplines, a significant number of attendees chose to spend part of their time in sessions other than their own specific discipline. Their participation and perspectives added greatly to the discussions during these sessions. On the last day of the workshop, a concluding session was held to review the previous three days and to give the attendees an opportunity to bring concerns or unresolved questions to the larger group for discussion. Workshop participants including HQ represented praised the workshop and expressed their satisfaction with the quality and comprehensive coverage of the technical presentations. It was noted by many participants that this workshop was long overdue and hopefully will be repeated in the future.

In developing the workshop, CEMVD, CELRD, and ERDC kept the following in mind. Navigation of our inland waterways is vital to our national interests, and to our national economy. The Corps has been tasked with a very important mission in regard to our national waterways. It is estimated that inland waterborne traffic will increase by over 30 percent in the next 20 years. As navigation on our rivers increases, the Corps will be faced with new and continuing challenges in maintaining and improving our nation's inland navigation infrastructure. At the same time, it is estimated that about 50 percent of the federal workforce will be eligible for retirement in the next 5-10 years. This trend will also affect the area of lock design as many experienced engineers are approaching retirement. The Corps must continue to develop and maintain its technical skills in order to meet increasing and changing needs. The Corps must ensure its ability to continue to deliver cost effective and environmentally sound navigation projects. The Corps has some big challenges ahead in the area of lock design. As the volume of inland navigation traffic increases, the Corps will continue to be faced with technical challenges in maintaining and improving our nations inland navigation infrastructure. LRD and MVD comprise much of the inland navigation design expertise within COE. Now was the right time for this workshop as the number of experienced lock design engineers in these two divisions has declined and many experienced engineers are approaching retirement.

The workshop proceedings are being made available on compact disk. The CD will include most of the briefings and materials presented at the workshop. The intent is to provide each of the workshop attendees a copy of the CD (or at least one or two copies per district depending on the total number of CD's required). These CD's should be available this month.

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IT IS DIFFICULT TO SAY GOOD BYE OR GOOD NEWS THROUGH VALUE ADDED SERVICE

After several years of false starts it was 2001 and finally the year to demolish Building T-1, Fort Shafter. The building had been one of the buildings occupied by the Honolulu Engineer District (POH) and there were mixed feelings at its demise.

The building itself was a World War II vintage wood frame structure, and although there were no paint chips collected to determine the presence of lead-based paint, based on experience and age of the building, the building was assumed to be painted with lead-based paint, especially the exterior¹.

To protect demolition workers from potential lead exposure and to ensure proper disposal, the lead-based paint specification was added to the technical requirements. The demolition section of the specification requires debris to be tested for toxicity originating from Resource Conservation and Recovery Act (RCRA) metals². Past experience had shown that buildings of this type could be demolished and disposed as non-hazardous debris; however, the collection of a representative sample of the building would prove the nature of the debris and would protect the government from future issues of improper disposal.



Asbestos was another concern. Because the local landfill buries asbestos contaminated material differently and charges a premium as opposed to construction debris, the project specifications required asbestos removal prior to demolition. Removal and disposal of hazardous and special wastes, such as asbestos, is normally conducted by a hazardous waste

sub-contract, in this case, a sub-contractor to the demolition sub-contractor. It was during the removal of the asbestos that the hazardous waste sub-contractor noticed the interior ceilings and some walls were finished with *canec*.

¹ T-1 is located in the Palm Circle area of Fort Shafter. This is a historic district with the initial buildings constructed in 1907 and then a later surge of construction in World War II. (Many of the buildings on Palm Circle can be seen in the movie "Pearl Harbor"). The paint scheme for the buildings is white with light green trim and over the years all buildings had been painted many times to maintain the prime and proper setting of general officer housing and the command headquarters. Much of the paint on the buildings was lead-based to better ensure wearability and weatherability in the period before and immediately after World War II. T-1 started its life as a warehouse. It was later renovated causing the interior volume to change from high ceiling, single store open frame to two stories of offices with finished interior walls.

² Arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Lead and cadmium are the minimum required by the local landfill provided the owner knows the history of the building's use resulting in relative certainty that other RCRA metals are not present.

Canec is an acoustical, organic surfacing material manufactured in sheets similar in size to gypsum board. The organic fibers are a by-product from the extraction of sugar from cane. Arsenic was added to the canec sheets to prevent insect infestation. Canec had recently come to the attention of hazardous waste contractor's due to a memorandum circulated by the State of Hawaii Department of Health warning of canec derived arsenic in schools.

Manufacturing of canec has not occurred in Hawaii since the 1960 tsunami that demolished the plant located in Hilo, Island of Hawaii, so few people were aware of the potential hazard of canec. However, discovery of canec, and thus potential revenues from arsenic abatement, became an incentive for the hazardous waste and demolition sub-contractors throughout the State. Thinking proactively the demolition sub-contractor ordered that a discrete sample of canec be collected and analyzed for total arsenic to provide supporting evidence for a potential claim.

The demolition of Building T-1 was tentatively scheduled for mid to late January 2001, after the removal and disposal of asbestos. On 19 December 2000 the prime contractor notified the project engineer that the demolition debris would be a hazardous waste. This determination was based on the results of the toxic characteristic leaching procedure (TCLP) extraction and analysis for lead from the representative building sample and the assumption that the arsenic in the canec sample would leach more than the RCRA permissible limit.

Hazardous waste cannot be disposed in Hawaii. It must be packaged, manifested, and shipped to the mainland (continental US) for proper disposal in a RCRA permitted transfer, storage and disposal facility (TSDF). A finding of hazardous waste this late in the project had the potential to dramatically increase cost and causes a major delay of the project. Being just prior to the holiday season was also a concern for coordination. This is a case where good project engineers earn their pay. Before making a decision the project engineer consulted the in-house hazardous waste expert (SME: subject matter expert) for guidance.

On the surface the results were damaging. The TCLP extraction and analysis for lead showed a concentration of 7.9-mg/l lead. The minimum level for determining lead toxicity per EPA guidance is 5 mg/l. If the results were truly representative of the debris, the debris would be hazardous waste. The canec sample also showed arsenic at 1700 mg/kg. The arsenic content was substantial, but the concentration of arsenic did not in itself render the debris hazardous. It is not the content of arsenic in the debris, but the concentration of arsenic that leaches from the debris, that is the determining factor.

Satisfying customers is the most important aspect of the Corps' business process. To the customer, satisfaction means delivering a quality product within schedule and cost and with value-added service. Before POH was willing to accept the subcontractor's results, POH wanted assurance that the samples had truly been collected and analyzed using the time tested protocol prescribed in the specifications³. Thus, the next step was to inspect T-1 followed by a query of the sampler to determine what protocol had been followed for collection.

³ The specified protocol requires a pre-demolition representative sample of the building to be collected. Architectural elements are categorized by materials of construction. Ratios of the area of each element compared to the total area are used to determine the number of sub-samples collected from each architectural element. Sub-samples are composited into a single representative building sample.

The field inspection indicated that, although the sampler may have followed a sampling protocol that had been accepted by other customers, the sampler had not followed the protocol delineated in the specification. This is not unusual when the sampler is a sub-contractor of a sub-contractor. In most cases the prime contractor doesn't have the expertise to determine if the subs are following specified protocols. The prime's primary interest is cost. In many cases the subs are asked to provide fee quotes without a review of the specification, and in this case, the sampling sub-contractor provided a quote and performed the collection in a method that was assumed to be acceptable since no customer had complained in the past. The Corps, by providing informed oversight, protects our customer from unwarranted cost growth resulting from such assumptions.

A discussion with the sampler revealed that the composite, representative sample had been collected contrary to the specified protocol. The sampler had collected plugs of various architectural elements of the structure thinking that these plugs could be combined into a sample representative of the building. Unfortunately, in most cases the plugs were not full-depth and did not represent the entire architectural element. In the case of the exterior walls, the sampler had only collected plugs that represented the surface paint and perhaps a 1/8th-inch depth of the exterior tongue and groove planking. No plug was bored completely through a wall, or flooring or roof to collect the surface material and the structural element beneath. This meant that a composite of the sub-samples would skew the results toward a higher lead concentration, as paint would comprise a greater portion of the composite.

The sampler stated that at no time was the specified protocol consulted nor had it been provided. The sampler stated the architectural elements were visually estimated and not measured to determine the true percentage of each as each related to the entire structure. Plugs were then collected, placed in individual sample bags, and transported to the laboratory where each was pulverized in a laboratory blender. Decontamination of the blender between sub-samples was not considered. The pulverized samples were then combined per the estimated percentages to form the representative debris sample.

Based on this information, the contractor's laboratory results were not accepted as the sampling protocol and compositing introduced unacceptable uncertainty. POH could not ask the customer to accept an extended completion date and increased cost of approximately \$1M for additional waste minimization, packaging and shipping to a TSDF when questionable analytical results could not justify the action.

A meeting between POH, the prime contractor and all affected sub-contractors was set to discuss the reasons for refusal and to explain the protocol. The only sub-contractor that could not attend was the certified industrial hygienist (CIH) that had set the protocol for the initial sampling. All present agreed that a new representative sample would be collected with the POH SME observing the collection and providing field guidance. The CIH would be instructed to review the various architectural elements in T-1 and to determine the number of full-depth sub-samples using the specified protocol. The sub-samples were to be collected using a drill that would provide cuttings and not plugs, and the sub-samples were to be composited during collection.

When the day came to collect the representative sample, the POH SME observed the field methods and provided suggestions. For all intents and purposes the field methods were well done. Questions did arise concerning the number of sub-samples per architectural element and the obvious omission of particular elements. As an example, the CIH had grouped all interior walls into a single element, when in reality some walls were gypsum board on metal studs, gypsum board on wood studs, canec and plywood on wood studs and reinforced concrete. Apparently the CIH had not visited the site, but had

relied on floor plans to determine elements. This again introduced uncertainty even if the field collection was performed in a professional manner.

With some question as to the degree the sample represented the debris that would be created by demolishing T-1, the sample was delivered to the laboratory for extraction and analysis. This analysis was to include the concentration of arsenic. In reality, all eight RCRA metals were listed for analysis.

Thus far the quest for quality had extended the demolition schedule, but the extension did not affect the project's critical path. There was also a slight increase in the laboratory cost, as arsenic analysis was not included in the original specifications, but this increase was less than \$200.



Because architectural elements were in question, the Corps SME inspected T-1, determined architectural elements and collected an independent representative sample using the specified protocol. Analysis of the eight RCRA metals was performed on the Corps collected sample. The project engineer and the prime contractor observed all field activities. Enough samples were collected to allow a split should the sub-contractor

wish to verify the final results.

Laboratory result of the contractor's second composite sample was greater (6.9 mg/l) than the 5 mg/l lead limit. All other metals were below the RCRA limits. In comparison, the POH result for lead was well below (1.6 mg/l) the 5-mg/l limit. As in the contractor's results, all other metals were below the RCRA hazard determination concentrations. The Corps' results were accepted as the governing results and the contractor was ordered to demolish the building and dispose of the debris in the local landfill as non-hazardous debris.

It should be noted that the demolition sub-contractor was unhappy with the decision and submitting several letters to both the Corps and the State of Hawaii Department of Health (DOH) implying POH had intentionally collected the sample to skew the results to reflect non-hazardous result. This was expected, and all linear measurements and area calculations were recorded by POH for future reference. The SME prepared memoranda to document the Corps' position and protocol. These memoranda were provided to the Solid and Hazardous Waste Branch of DOH. When the demolition sub-contractor requested DOH determine which results should govern, DOH responded in favor of the Corps indicating it was POH's responsibility as the owner's agent to determine the hazardous content of the debris and that the Corps has sufficiently justified the results.

T-1 was finally demolished on 26 March 2001 with the debris disposed in the local landfill. The delay did not affect the final project completion as other activities continued during the extended sampling and analysis process. POH had risked project delays, cost overruns, and customer dissatisfaction to assert its point. However POH's confidence in its expertise had overcome contractor conflicts to the ultimate satisfaction of the customer and DOH. Corps oversight prevented cost growth to the government in the neighborhood of \$1M. This value-added service is expected by our customers and goes unnoticed until the system breaks down.

As a result of the coordination between POH and DOH during this episode, POH was asked to sit on the committee to develop guidelines for sampling and disposal of construction and demolition debris

for the State of Hawaii. As of this writing the guidelines have not been finalized, but the importance of setting a protocol for the collection of a pre-demolition representative sample is an important part of the draft guidelines.

A corollary:

Hawaii is a remotely located archipelago. It has little area where landfills can be constructed. The island of Oahu alone has a population of nearly one million with only one landfill. H-Power is a “trash to energy” plant that burns non-hazardous refuse for energy recovery. Building debris is not burned in the facility, but is landfill, even if it is non-hazardous. The current emphasis is to recycle as much of the building debris as possible. Unfortunately, there are few locally developed markets for recycled materials. Scrap metal has been a traditional recyclable item, but businesses find it difficult to make recycling economically feasible for other products. The Corps is also working with the State Department of Health to develop guidelines for recycling materials that are non-polluting.

The EPA memorandum issued 31 July 2000 allowing housing painted with lead-based paint to be disposed in a landfill without determination of RCRA hazard has been a blessing and a burden. Old housing painted with lead-based paint can now be demolished and disposed without TCLP extraction and analysis. This relieves the owners of costly sampling and possible mainland disposal that, in turn, protects our children by getting lead-based painted buildings out of the housing market.



Unfortunately, the tipping fee at the landfill has risen to \$86 per ton and contractors are looking to recycle more of the debris. Many have mistakenly assumed that the debris that passes TCLP can be recycled and have requested permission to compost the debris. Currently the State has not granted permission to recycle any material painted with lead-based paint, even if it passes TCLP. Without further study it is not currently feasible to try to remove lead-based paint from family housing only to compost the lead-containing debris, and perhaps, place the compost back in the community as garden and lawn additives where children can again become exposed to lead.

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TRANSPORTATION SYSTEMS CENTER – WORLD CLASS EXPERTISE AND SERVICES WORLDWIDE

With more peacekeeping missions occurring around the world the Transportation Systems Center is being called to remote locations for their expertise in pavements. The Transportation Systems Center has been called upon by the Ballistic Missile Defense Organization, U.S. Army Europe, U.S. Army Pacific, the 8th Army in Korea, and SouthCOM, to name a few. They also have gone to far off places to help out the Transatlantic Programs Center and the Mobile District. The Transportation Systems Center provides a unique “One Stop” service for transportation systems planning, design and construction. Customers around the world can call upon the TSMCX at any time for the technical services described below.

Airfield Engineering -- The Transportation Systems Center provides recommendations for maintenance and repair of existing airfield pavements. They perform airfield obstruction mitigation

surveys and assist in preparing waivers to airfield engineering criteria. They also provide airfield suitability studies in conjunction with siting new runways or extending existing runways. For more information contact B.J. Skar, (402) 221-7262 or e-mail bernard.j.skar@usace.army.mil.

Roadway and Railroad Engineering -- The Transportation Systems Center provides recommendations for maintenance and repair of existing roadway pavements and railroads. Services include on-site and/or telephonic consulting services, value engineering studies, railroad track inspections and planning assistance for new construction. For more information contact Dan Boyer, (402) 221-7266 or e-mail dan.j.boyer@usace.army.mil.

Design Reviews -- The Transportation Systems Center reviews airfield, roadway and railroad design projects. HQ USACE policy requires all airfield and railroad project designs, regardless of funding type, be reviewed by the TSMCX (the policy letter can be viewed on the TSMCX website at www.tsmcx.com). All projects, regardless of funding type, where the roadway portion is over \$3M also require TSMCX review. The Transportation Systems Center also reviews job order contracts, aids in compliance to DOD Engineering Criteria and Safety Standards (fulfills requirement for AR 420-10), and reviews DD Form 1391s. POC's: Airfields - B.J. Skar, (402) 221-7262, e-mail bernard.j.skar@usace.army.mil; Roadways and Railroads - Dan Boyer, (402) 221-7266, e-mail dan.j.boyer@usace.army.mil; and Airfield Lighting/NAVAIDS - John Gregory, (402) 221-7267, e-mail john.b.gregory@usace.army.mil.

Construction Support -- The Transportation Systems Center provides a wide variety of construction support services to include: conducting on-site Airfield Paving Workshops; providing A-E contracts for construction management of airfields; technical review of shop drawing submittals and HMA/PCC mix design submittals; and assisting with preparatory inspections, batch plant inspections, test sections, and paving problems during construction. HQ USACE policy requires airfield paving workshops be conducted for all airfield projects over \$5M.

The TSMCX provides on-site Airfield Paving Workshops on how to construct quality hot-mix asphalt (HMA) and portland cement concrete (PCC) airfield pavements. Workshops are provided for Corps Quality Assurance (QA) staff, contractor and subcontractor Quality Control (QC) and construction staff, materials suppliers, and testing personnel. Corps' designers, local Air Force Base Civil Engineers (BCE) and any Director of Public Works staff are also invited to attend.

The workshops are tailored to specific project requirements and are usually one day for HMA paving and two days for PCC slipform paving. HMA workshops include overview of HMA, mixing plant operations, placement, compaction, materials testing, QC/QA testing and inspection, control charts, troubleshooting and a review of contract specification 02749. PCC Workshops include mixing plant operations, materials testing, QC/QA testing and inspection, slipform paving, finishing, texturing, curing, grooving, joints, joint sealing, demolition, and review of contract specification 02753. For more information on the workshops or construction support contact Terry Sherman, (402) 221-7260 or e-mail terry.w.sherman@usace.army.mil.

A-E Indefinite Delivery Contracts -- The Transportation Systems Center has Fixed Price Indefinite Delivery Type (IDT) Contracts for Airfield and Roadway Design and Evaluation, Railroad and Roadway Design and Evaluation, Construction Management for Airfields, Pavement Maintenance Engineering Management System (PAVER), and Railroad Maintenance Engineering Management System (RAILER). The contracts can be utilized by any of the Corps' District Commands or Research

Laboratories for either military or civil works projects. For more information contact Dan Boyer, (402) 221-7266, e-mail dan.j.boyer@usace.army.mil or John Gregory, (402) 221-7267, e-mail john.b.gregory@usace.army.mil.

PCASE -- With just a click of the mouse help is on its way for pavement and railroad engineers. For designers, PCASE software is available to help you determine pavement thicknesses for both airfields and roadways using many different scenarios in minutes. For evaluators there is software for equipment support and analysis. Software is available that can interpret nondestructive test data for use in pavement designs and evaluations. Analysis software is available that can determine pavement life, classification numbers, allowable loads and more. The software is developed by the Corps of Engineers through the Pavement-Transportation Computer Assisted Structural Engineering (PCASE) program and is available at www.pcase.com. Many users from all over the world visit the site daily. PCASE also offers regional workshops. The workshops provide "hands-on" training on the use and availability of the computer programs. We also cover some of the basics of design and evaluation criteria. The workshops are 2-3 days depending on the number of programs the hosting agency would like to cover. The majority of the workshops have been CONUS and a few OCONUS (Hawaii, Alaska and Germany). Workshops for next year are being planned for Japan, Korea and back to Germany. For more information contact Mary Adolf, (402) 221-7265 or e-mail mary.j.adolf@usace.army.mil.

Field Force Engineering (FFE) -- The Transportation Systems Center supports HQ CECS-OP with the development of training sessions for FFE. The training will help to prepare FFE Infrastructure Teams from the district civilians to support the Army during Contingency Operations in the Theater. The training concentrates on the construction or evaluation of roads and airfields to support troop movements. Overall the FFE training helps our district personnel understand the Army organization and what type of engineering support will be required during a deployment. For more information contact Dan Boyer, (402) 221-7266, e-mail dan.j.boyer@usace.army.mil or B.J. Skar, (402) 221-7262, e-mail bernard.j.skar@usace.army.mil.

Tri-Service Transportation Systems Workshop -- Every four years the Transportation Systems Center along with the help of the Navy, Air Force and USACE ERDC and HQ USACE plans and participates in a Tri-Service Transportation Systems Workshop. Engineers around the world come to speak and to participate in the workshop. The workshops have been hugely successful (with more than 350 engineers in attendance) in building bonds and solutions for the transportation systems community. For more information contact Mary Adolf, (402) 221-7265 or e-mail mary.j.adolf@usace.army.mil.

Newsletter -- Pavement and Railroad Engineers can receive the latest transportation-related news with *Transportation News*, a newsletter published by the Transportation Systems Center. Articles include topics on criteria, research, software, lessons learned, design and construction projects, etc. *Transportation News* is available on the TSMCX website at www.tsmcx.com or hard copies can be obtained by contacting Mary Adolf, (402) 221-7265 or e-mail mary.j.adolf@usace.army.mil.

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CIVIL ENGINEER TAKES TACTICAL TRAINING WITH TROOPS

"Welcome to the Engineer Officer Advanced Course -- Reserve Component!"

These were the first words Deanne Strauser heard on arrival at the U.S. Army Engineer School at Fort Leonard Wood, MO. Strauser is a civil engineer in the St. Louis District. She attended the two-week

course last November through the cooperative efforts of the U.S. Army Corps of Engineers and the Engineer School. This cooperative professional development opportunity offers Corps civilian engineers a chance to obtain tactical and technical training, and gives them greater visibility in the Army.



Deanne Strauser (center) a civil engineer with the St. Louis District, takes part in a terrain analysis exercise during the Engineer Officer Advanced Course.

As a student in the course, Strauser was assigned to C Company, 554th Engineer Battalion, 1st Engineer Brigade. They train and provide command support for all engineer student officers. This tactical and technical training allowed Strauser to see total force training and the interaction between active and reserve officers.

"The first week entailed understanding the fundamentals of U.S. offensive doctrine and tactical concepts of offensive operations," said Strauser. "We learned the organization and capabilities of armored division Combat Service Support units and the system for organizing and providing combat service support for tactical combat operations. In addition, we were taught the engineer battlefield function of mobility, countermobility, and survivability, and how to apply the principles in tactical situations.

"One of the more career-applicable classes to me was the terrain analysis class," Strauser said. "Here we conducted an analysis of the terrain from a military perspective with a view to understand how terrain can be used or manipulated to our advantage. Activities included using a computer assisted terrain evaluation system called TerraBase II to analyze an area of operation. This program used digital elevation data to create 3D views and evaluation of the terrain.

"We continued to learn how to conduct an engineer battlefield assessment, including friendly and enemy mobility, countermobility, and survivability, to determine threat courses of action, and how to apply military decision-making to a tactical situation," said Strauser. "We developed facts, assumptions, conducted mission analysis, and developed a mission statement. We then went on to engineer defensive planning -- obstacle integration doctrine and survivability doctrine. We learned how to write and brief an engineer company operations order.

"Week two. This part of the course included the technical engineering product," Strauser continued. "Course work consisted of different methods of soil stabilization, classification, compaction, specifications, and cost of stabilization additives. A class in basic hydrology taught runoff estimation, drainage basin delineation, flow paths, and erosion control in support of ditch and culvert design. "We also applied the project management critical path method to several construction directives," Strauser said. "This involved preparing a critical path logic network, determining the best method of construction, scheduling, and working with resource constraints.

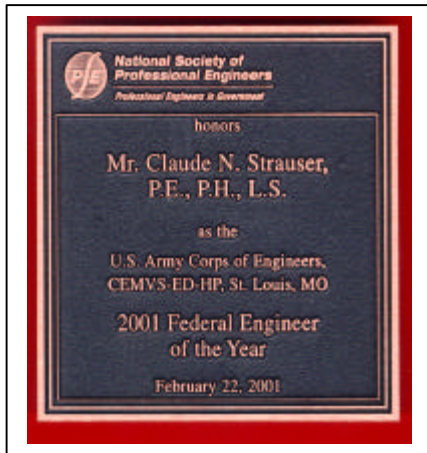
"The final class concentrated on the practical application of assessing environmental-related risks when performing all previous learned activities," Strauser said. "This exercise employed a risk-management work sheet to document and track risk. These environmental risks were then incorporated into an operational plan.

"In summary, this was an intense, information-packed course," said Strauser. "As a civil engineer, and a DoD civilian employee, this was a definite benefit to my training program and career development. I gained a civilian perspective into military engineering and planning, as well as a technology exchange between the Corps and the Engineer School. This course has most certainly enhanced the 'One Corps, One Regiment, One Fight' philosophy. It is my opinion that many civilian employees can benefit from this course, especially anyone that has a military customer or produces support products for the military."

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ST. LOUIS DISTRICT EMPLOYEE IS USACE 2001 FEDERAL ENGINEER OF THE YEAR



Claude N. Strauser, P.E., P.H., L.S., Chief Hydrologic and Hydraulics Branch, has been selected US Army Corps of Engineers Engineer of the Year by the National Society of Professional Engineers (NSPE). The top ten finalists of the 2001 Federal Engineer of the Year Program were honored at the 22nd Annual National Engineers Week luncheon on 22 February 2001 at Ft. Myer, VA. The Federal Engineer of the Year Award program recognizes outstanding engineers employed in the federal government.

"Over the last three decades, Strauser has led a team of engineers and scientists and created what we believe to be a new field of engineering, appropriately called 'Environmental River

Engineering,'" said BG Edwin J. Arnold, Jr., Division Engineer, Mississippi River Division, who nominated Claude for this award. The goal of this field is to obtain and maintain a safe and dependable navigation channel in an environmentally sensitive manner by adopting a multidisciplinary professional team approach to satisfy the contemporary needs.

Strauser has authored/co-authored 19 professional papers in river restoration and is a sought-after lecturer in this field. In addition to this most recent honor, he has received numerous awards, including Chief of Engineers Engineer Design Team of the Year Award, 2000; Chief of Engineers Design and Environmental Award, 2000, 1998; U.S. Army Corps of Engineers Civilian of the Year, 1997; Presidential Award for Design Excellence, 1994, Mississippi River Restoration Award, American Rivers, 1997; and the Conservationist of the Year Award, Migratory Waterfowl Hunters, Inc., 1996. Claude earned his bachelor's and professional degrees in civil engineering from the University of Missouri-Rolla. He is a member of the National Society of Professional Engineers, American Society of Civil Engineers, Missouri Association of Registered Land Surveyors, the Society of American Military Engineers, and the Permanent International Association of Navigation Congress, where he serves as a U.S. representative to the International Winter Navigation Workgroup.



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District of the Month



Champion of Your Heartland's Water Resources

History -- The St. Louis District, the city of St. Louis, MO, and the Mississippi River histories are as one and cannot be separated. Therefore, the story of the St. Louis District must begin with the rich and legendary history of the river...

The Mighty Mississippi River, over 2,220 miles long, existed before the last ice age. It is the second longest river in the United States and the third largest river basin in the world, exceeded in size only by those of the Amazon and the Congo. All water between the Appalachian Mountains in the East and the Rocky Mountains in the West eventually flows into the Mississippi. The Mississippi River Basin is a very large system, with watersheds draining 1,245,000 square miles. The central portion is known as the Middle Mississippi, a 300-mile reach from Saverton, Missouri to Cairo, Illinois. St. Louis, Missouri is located about halfway between these two points. Further defining the Middle Mississippi are the confluences of three major tributaries, the Illinois, the Missouri and the Ohio Rivers. This area is the responsibility of the St. Louis District.

The natural state of the Middle Mississippi is narrow and deep. In the early 19th century, great forests spread out across the rich alluvial bottoms and lined the narrow river's banks. The Louisiana Purchase in 1803 marked the opening of the West, and river settlements began to grow. In 1817, the first steamboat arrived in St. Louis, the population soared, and steamboat arrivals had increased more than a thousand fold by 1858, turning the river into a superhighway.

As the rich timber resources lining the riverbanks were used to build rapidly expanding settlements, to fuel the steamboat's boilers, and were cleared for agricultural purposes, the forests were decimated. The riverbanks became less stable and rapidly deteriorated; the river widened, the banks crumbled and trees fell into the river impeding navigation. The tree snags, the shallowness of the channel, and the steamboat traffic congestion combined to make navigation difficult and steamboat travel dangerous. Many lives and vessels were lost. In *Life on the Mississippi*, Mark Twain states that during the 1880s, the river claimed approximately one steamboat wreck per mile from St. Louis to the Mississippi's confluence with the Ohio River.

In 1880, Congress directed the Corps of Engineers to correct the disastrous condition of the river by creating and maintaining a safe and dependable navigation channel and returning the river to its once majestic condition. Engineers set out to reverse man's destruction, stabilize the riverbanks and design navigation structures to work in harmony with the natural laws of the river. A variety of methods and structures were employed. Banks were stabilized, sediment was dredged from the channel, and snag boats were used to clear downed trees, wrecked steamboats, and other debris.

“The military engineers have taken upon their shoulders the job of making the Mississippi over again—a job transcended in size by only the original job of creating it.” Mark Twain, *Life on the Mississippi*.

Today, the river closely resembles the dimensions it held in the early 1800s, achieved through the use of a variety of river structures which worked to guide the current, stabilize banks and encourage a narrowing of the river's width through a natural buildup of siltation. The process took many years. The Middle Mississippi River has been restored to its majestic size and its navigational systems have been strengthened. Once this objective was achieved, the Corps began to examine the biological impact of the navigational structures on the river's ecosystem.

In 1970, when the Missouri Department of Conservation expressed their concern over the lack of species diversity in the Mississippi River, the St. Louis District began to search for ways to correct this situation. This inquiry led to a project that continues today in an environmentally sensitive manner--to work in harmony with the natural laws of the river. (See “River Restoration Measures in Four Secondary Channels of the Mississippi River, An Interagency Success Story”, *Infrastructure Magazine*, Spring 1998).

The St. Louis District is an engineering and water resource agency dedicated to maintaining a proper and healthy balance of the multiple uses of the heartland's waterways. Originally charged with the civil works mission of establishing and maintaining a 300-mile 9-foot x 300-foot navigation channel on the Mighty Mississippi River, the maintenance of this channel remains its primary mission today. The District is also responsible for maintaining a navigation channel on the lower 80 miles of the Illinois River and the lower 36 miles of the Kaskaskia River. The St. Louis District supports the needs of the community and the environment through such additional civil missions as flood damage reduction, environmental restoration, water supply, regulatory oversight, disaster response, hydropower, dam safety monitoring, recreation, the Formerly Utilized Sites Remedial Action Program (FUSRAP), the Directory of Expertise for Photogrammetric mapping, which includes a number of Support For Others (SFO) programs and the Center of Expertise for Automated Performance Monitoring of Dams. Military missions include the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS), and the Mandatory Center of Expertise (MCX) curation/management of archaeological collections including many DOD wide projects.

Although comparatively small in terms of area, this district's geographic location on the Mighty Mississippi River places it in a unique and strategically critical position concerning the management of one of the busiest navigable waterways in the nation. Requiring both upper (locks and dams) and lower (open) river management technology, the integration of a high level of varying technical and engineering expertise to manage the river's transition from locking to open river is essential. In no other district is this kind of expertise available or required at this level on a mainstem waterway. Because support to navigation is our primary mission, the criticality of maintaining our 300 miles of this nearly 2300-mile channel in a safe and dependable manner cannot be understated. However, the St. Louis District, with its abundance of widely recognized engineering experts, views this kind of challenge as all in a typical day's work.

The District operates four Locks and Dams on the Mississippi and one on the Kaskaskia River. Five flood control reservoirs, Lakes Shelbyville, Rend and Carlyle in Illinois, and Mark Twain and Wappapello Lakes in Missouri, are critical in maintaining a manageable river stage during flood events. At Mark Twain Lake, the Clarence Cannon Dam spans the Salt River Valley 63 miles upstream

from its confluence with the Mississippi River and is capable of producing 58,000 kilowatts of hydroelectric power. An important side benefit of the flood control reservoirs is the significant recreation opportunities provided to the area, as well as the opportunity to enhance the environment and reach out to the public as educators. The District Speakers Bureau, an additional wealth of expertise, stands ready to lecture or impart knowledge at civic and educational institution events at every opportunity.

The St. Louis District is known not only for its historical significance, but also for its diversity and depth of expertise within the scientific and engineering communities. Many of the District's engineers, projects and technological developments have garnered awards and acclaim both nationally and internationally. The District is home to a team of fearless experts who continually take the road less traveled and use their innovation and creativity to improve service to the customer and to the nation. The following are just a few examples of what makes the St. Louis District unique, note-worthy and interesting, and illustrates the diversity of talent that resides within this District:

Design Branch (Chief, Bob Hughey) -- One of the most important missions assigned to the Corps is to insure the safe and reliable operation of the lock and dam system on our rivers, which includes providing timely repairs to the locks in order to transport goods and services with minimal interruption. Tom Ruf, Structural Engineer, is a leader in the use of innovative technology, and in adaptation of aerospace technology that assists in predicting when structural steel lock and dam components are stressed and in need of replacement which could cut down on lock closure times. Tom's efforts are estimated to have saved the towing industry \$30 million in delay costs. Along the same lines, the St. Louis District is a pioneer in an improved method of pre-stressing miter gate diagonals, using hydraulic tensioners, safer and more accurate than standard methods. See related story by Tom Ruf and Esprit Oct 99 article by Rob Kelsey.

FEMS/Condition Monitoring and Predictive Maintenance -- The St. Louis District is taking the lead in a partnership with CERL, the Nashville District and the New Orleans District to combine FEMS (a CECW-O initiated Facility Equipment Management System that uses a software package called Maximo) and the Condition Monitoring and Predictive Maintenance research program sponsored by CERL. SLD's role is to provide computerized systems and electronic instrumentation to gather and sense real time equipment condition and feed that information into the FEMS system. This will provide FEMS with the capability not only to provide information concerning routine maintenance procedures but also to detect potential problems before equipment failure. Work has begun to implement pilot programs at Barkley Lock in Nashville District and Port Allen Lock in New Orleans District.

Geospatial Engineering Branch (Chief, Brad Strauser) -- This branch is designated as a "Directory of Expertise" (DX) for Photogrammetric Mapping. Design and technical assistance services to USACE commands are advisory, and services provided to customers are on a reimbursable basis. Past customers include the White House, by name request, and the government of Japan. The DX, led by Certified Photogrammetrist, Dennis Morgan, has the technical expertise to plan, estimate cost, and acquire aerial photography, remote sensing, photogrammetric map compilation, soft-copy photogrammetry, and related spatial/digital mapping products used for input in GIS, CADD, LIS and AM/FM databases. The DX provides rapid response, full service photogrammetric mapping support to civil works, military design, construction and environmental restoration programs consistent with Federal Photogrammetric Mapping guidelines. Customer benefits include the use of on-board contractors located throughout the continental U.S. to avoid individual contracting costs. Data can be

provided in a variety of formats (InterGraph, Arc/Info, etc.) consistent with customer requirements. Photogrammetric specialists are available for technical advice during any phase of the mapping project. Primary responsibility for procuring photogrammetric services resides with DX personnel and frees the customer to concentrate efforts on other endeavors. Projects of any size and complexity can be accepted.

Projects include: Airborne GPS Controlled Photogrammetry, GIS Development, Digital Orthophotography, DEMs & DTMs, Large & Small Scale Topographic Mapping, Remote Sensing, Land-use Classification, Softcopy Photogrammetry and Historical Photography Searches. Cartographer Dave Kreighbaum led the research in the technological breakthrough for Softcopy Photogrammetry with a project to map Superfund sites using a digital camera. Cartographer Bob Mesko and Project Manager/Civil Engineer Deanne Strauser recently launched Light Detection and Ranging (LIDAR) Laser Mapping technology, a fully automatic method of directly measuring height of elevation of terrain from aircraft to map a rail corridor from St. Louis, MO to Chicago, IL. Emphasis of the LIDAR project was to determine whether RR crossings require upgrading to accommodate a high-speed railroad from St. Louis to Chicago. The St. Louis District is a trailblazer among Corps Districts in use of this technology for rail transit and levee mapping.

The Engineering Data Management Section, led by Charlie Turlin, is known for its use of state-of-the-art multi-beam hydrographic survey capabilities. Branch personnel Jim Keim, Joe Burnett, and John Naeger designed and put the Motor Vessel Boyer, the District's newest state-of-the-art Hydrographic Survey Craft, into service on our nation's major waterways. The MV Boyer and its sister-craft, the MV Simpson are both highly regarded instruments in the use of multi-beam and GPS positioning technology.

Hydraulic and Hydrologic Branch (Chief, Claude Strauser) -- The St. Louis District has faced the challenges of the Mighty Mississippi in the same way, as did Mark Twain, with reverence. The river has always posed a major challenge to engineers in trying to work with the natural forces of the river in order to achieve a safe and dependable navigation channel in an environmentally sensitive fashion. Meeting the needs of landowners, farmers, the environment, various industries and the public at large while providing flood control, adequate navigation channels, recreational resources and a diverse biological environment has always been fraught with conflict. However, the St. Louis District has proven through the "Environmental River Engineering Project on the Mississippi" (winner 1995 Federal Design Achievement Award, and 1995 American Society of Civil Engineers, St. Louis Section, Outstanding Civil Engineering Achievement Award), that diverse interests can work together and that navigation can be improved through the use of innovative river structures while positively impacting the biological environment. These new river control approaches include designs such as Blunt Nosed Chevrons, Off-Bankline Revetments, Notched Dikes and the award winning "Bendway Weirs." Bendway Weirs awards include the only national Chief of Engineers Design and Environmental Award of Excellence presented in 1991, winner of the Federal Design Achievement Award in 1992 (winner of 500 submissions from 74 agencies), which led to the Presidential Award for Design Excellence in 1994—the highest design award presented in the federal government, the national American Society of Civil Engineers Award of Merit, 1992, and the DA Research and Development Achievement Award. The various structures have revolutionized how engineers maintain a safe and dependable navigation channel on the Mississippi River in an environmentally sensitive manner and are used as a model for other districts and other locations throughout the nation. The Environmental River Engineering Project on the Mississippi, winner of the 1995 Federal Design

Achievement Award, integrates river engineering & environmental issues, creating habitat diversity resulting in a system that meets environmental, navigation and economic goals.

A new technological tool, "Micro Modeling," winner of the Chief of Engineers Design and Environmental Award, conceptualized, designed and first applied at the St. Louis District's Applied River Engineering Center (AREC). The AREC, led by Hydraulic Engineer, Rob Davinroy, is a significant contributor to the application of these innovations. These models use state of the art electronics and computer software to simulate a myriad of river conditions in a tabletop-size model. Because of the small size, sediment transport studies can be performed at a low cost with results available in a few weeks. This has proven to be a valuable tool for small local governments and other customers with limited resources. Models are portable and can be transported to the customer if necessary. Because the effects can be seen visually, they provide a common basis for communication between engineers and non-engineers. In 1994, Micro Modeling received an innovation award from the St. Louis Academy of Science. In 1997, U.S. Patent Number 5653592 was granted to the U.S. Army Corps of Engineers for the Micro Modeling Technology (See District website, "Tiny Models Provide Large Insights", HQUSACE Engineer Update, Apr 98, and Esprit, Feb 98 for more detailed information).

The St. Louis District is the home of the conceptualization and implementation of Environmental Pool Management, winner of the Presidential National Performance Award Committee's Hammer Award in 1997, and winner of the 1998 Chief of Engineers Design and Environmental Awards Competition Honor Award. Water control manager Dave Busse and biologists partnered to develop an environmentally sensitive navigation pool level management schedule, involving timely drawdowns, resulting in increased vegetative growth, critical to the Upper Mississippi River food chain. Additional cost to taxpayers was Zero Dollars. This environmentally beneficial method, conducted in conjunction with the Upper Mississippi River Conservation Commission, reflects mutually beneficial sharing of the river--a true step toward ecosystem management on the Upper Mississippi River System.

The concept of a nonstructural, environmentally friendly solution to a potential navigation and erosion catastrophe was developed and implemented in the St. Louis District by Hydraulic Engineer, Jerry Rapp, and partner, Lester Goodin, President, Buffalo Island/Thompson Bend Soil Conservation Association. The Thompson Bend Riparian Corridor Project, consists of a system of tree screens, specially bred for their fast growth and resistance, which have significantly controlled erosion along a 17-mile reach of the Mississippi and maintained the continuous Mississippi River navigation channel. Most engineering projects require the participation of specialists in various areas of expertise. Real Estate Specialist, Sharon Wolf and Natural Resource Specialist Dan Erickson contributed significantly to the success of this project. The project was awarded the 2001 Environmental Achievement Award of Distinction from the International Erosion Control Association, and the 2001 Federal Executive Board Team Award. (See related article—Thompson Bend).

During flood conditions, the Water Control staff is required to make continuous, critical and timely on-the-spot water release decisions, adjust reservoir levels, and implement deviations to normal methods to accommodate emergency conditions. They must always weigh the needs of the many against the needs of the few, and must possess the ability to explain their actions to concerned congressional representatives and landowners. As the primary point of contact for Congressional representatives, other Districts, Divisions, farmers, industry and citizens within the boundaries of the St. Louis District during hydrologic events, they provide real time and projected river stages, forecasts, etc. The St. Louis District Water Control staff has worked very hard for many years to gain a high level of public

trust. In-office, seven-day/24 hour water control operations are maintained 365 days a year. Key people are on 24-hour call.

St. Louis was the first district to adapt a UNET hydrologic model to a specific district (area) to forecast and conduct studies within the Mississippi River Basin. The Hydrologic Engineering Section serves as technical advisor to other districts in adapting the model to their specific geographic areas.

Ordnance and Technical Services Branch (Chief, Mike Dace) -- This is the only organization in the St. Louis District dedicated entirely to military missions. Accurate site characterization for environmental assessment and remediation is expensive and difficult with typical hazardous materials at military installations. The unique nature of munitions makes this an even more challenging task. The Archive Search Report process was developed to seek answers from available sources as to determine the nature and locations of potential hazards prior to using more costly techniques.

To date, the primary use of the ASR has been in association with the Formerly Used Defense Sites (FUDS) under the Defense Environmental Restoration Program (DERP). In 1986, Congress established DERP, and since the beginning, the U.S. Army Corps of Engineers has acted as the agency responsible for environmental restoration at FUDS. In October 1992, the Ordnance and Technical Services Branch began completing ASRs for Ordnance and Explosives (OE), and Chemical Warfare Materials (CWM). This work has been done at FUDS as well as active Department of Defense installations and installation transitions under Base Realignment and Closure (BRAC) recommendations. Following the publications of the Military Munitions Rule and the DoD Draft Proposed Range Rule in 1997, ED-P began preparing ASRs to facilitate development of range inventories and preliminary assessments on active installations, primarily the U.S. Marine Corps bases. (See related articles Oct 99 and Nov 99 Esprit and in this publication.)

Using the military research expertise gained from the ASR process, the Ordnance and Technical Services Branch has assisted other elements of the Army on several occasions to uncover the facts surrounding scandals. These investigations involved allegations of misconduct by American troops during World War II, the Korean and Vietnam Conflicts. ED-P's research was instrumental in showing the claims were unsubstantiated.

The ED-P team consists of historians, archivists, civil engineers, project managers, ammunition specialists, safety specialists (former military Explosive Ordnance Disposal), administrative and support staff and a systems/operations analyst.

Planning, Programs and Project Management Division (Chief, Gerald Barnes) -- The St. Louis District's Formerly Used Sites Remedial Activities Program (FUSRAP), under the direction of Program Manager Sharon Cotner is responsible for the protection of public health and the environment by removing low-level radioactive contamination generated by activities of the Manhattan Engineer District and the Atomic Energy Commission (MED/AEC) during the development of atomic weapons in the St. Louis Region in the 1940s and 1950s.

During World War II, the nation began a top-secret project to build the first atomic bomb. The Army created the Manhattan Engineering District (MED) to carry out much of the work of the "Manhattan Project". After the war, the nation sought ways to use nuclear energy for peaceful purposes and formed the Atomic Energy Commission (AEC) in 1946. Some of this work was performed in the St. Louis area.

From 1942 to 1957, the MED/AEC contracted with a St. Louis refinery and metal plant to process natural uranium, producing uranium oxide, trioxide and metal uranium. This became the St. Louis Downtown Site (SLDS). In 1946, MED acquired the 21-acre St. Louis Airport Site (SLAPS) for storage of residues and other material from the downtown site. In subsequent years, adjacent properties became contaminated as a result of erosion. In 1966, a private company purchased SLAPS residues, which contained valuable metals, and began hauling them to a site in Berkeley, Missouri, after which they were sold for their commercial value. Later, the material was sold again and much of it shipped to Colorado. Surveys in 1977 showed residual contamination on the property, part of which was later called the Hazelwood Interim Storage Site (HISS). Transport and migration of the material spread contamination along the haul routes to nearby properties. Although the federal government was not responsible for this contamination, Congress directed that the government add these sites to the Formerly Utilized Sites Remedial Action Program (FUSRAP). On October 4, 1989, SLAPS and HISS were added to the Environmental Protection Agency's National Priorities List (NPL). See related articles concerning Civil War Ordnance found on a WWII site in the 21st century, and such FUSRAP project management challenges as a 24/7 operation.

Environmental Management Program -- The St. Louis District is involved in a number of habitat rehabilitation projects. The project at Batchtown, Illinois, on the east bank of the Mississippi River in Pool 25, will improve the environmental quality of the terrestrial (primarily migratory waterfowl) and aquatic wildlife habitat in the Central Mississippi Valley. The project includes construction of a low sediment deflection berm to reduce siltation of backwater habitat and improve wetland unit water control. Sluice gates and stop log structures will control the hydrologic regime within the interior wetland compartments. Rehabilitating these habitats will provide enhanced opportunities for breeding, nesting and feeding for many forms of waterfowl and other area wildlife species. At Cuivre Island, structural measures are designed to replicate or restore the declining quality of aquatic and terrestrial habitat of chutes, sloughs, backwater areas, and wetlands. Approximately 90 acres of habitat will be created on the mainland adjacent to the Cuivre River. At Stump Lake, project features include construction of a low sediment deflection berm to reduce siltation of backwater habitat and improve wetland water control. Additional low level interior berms will be constructed, and dredging within portions of surrounding lakes will improve water delivery and facilitate fish movement, spawning and rearing. A reversible pumping system will be constructed to allow managed flooding or draining of the wetland compartments. Swan Lake project features include construction of a riverside berm structure to retard deposition of river sediment, construction of hillside sediment control basins and ponds, and construction or improvements of closure structures. Additional gates and pumps will provide sufficient interior lake water levels to maintain viable fish populations. Dredged lake sediment will be used to construct two barrier island groups to reduce wind generated wave action and turbidity levels within the lake. These projects require engineering design, geotechnical, hydraulic and construction expertise, and a close working relationship with environmental specialists within and outside the Corps.

Partnering Successes -- The District continues its partnering successes with the Missouri Department of Conservation (MDOC) and the National Audubon Society concerning environmental restoration/rehabilitation projects along the Mississippi River in Missouri. MDOC has committed to be a local sponsor for an environmental enhancement project under the Missouri and Middle Mississippi Rivers Enhancement project. The National Audubon Society requested inclusion as a potential local sponsor for future projects and has committed to work with the Corps and MDOC as

partners in preparing a comprehensive plan for a riparian habitat corridor along Pool 25 under Planning Assistance to the States.

Engineering projects are not accomplished strictly through the engineering and Project Management Divisions. Construction plays a major role in nearly every aspect of the Corps mission. The District's Construction Branch enjoys very special partnering efforts and successes with contractors. (See related story). Because real estate must be acquired or access must be gained for nearly every project, the Real Estate process is also an integral part of the project process. Real property must be acquired, managed and disposed of in strict adherence to the law. (See related article)

District Engineer, COL Michael Morrow and the District team welcome you to the St. Louis District. We are grateful for this opportunity to introduce you to some of our programs and successes. We are proud of our history and our accomplishments and hope the sampling of our diverse projects and achievements presented in this publication are of interest to you and will inspire you to check out our website at www.mvs.usace.army.mil for detailed/additional information on the projects cited above (click on Engineering Expertise), or any other aspects of the St. Louis District. See related articles in this publication and discover additional articles of interest accessed through the online Esprit, the St. Louis District's monthly newsletter.)

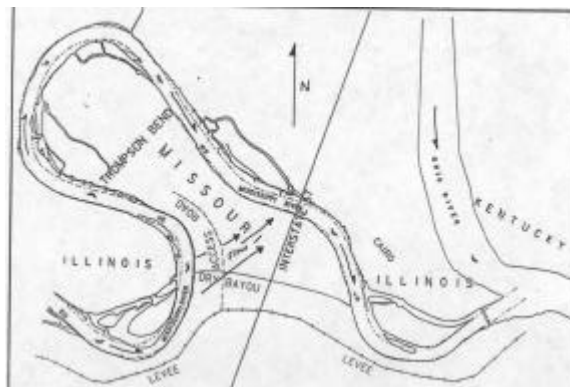
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THOMPSON BEND RIPARIAN CORRIDOR PROJECT: AN INNOVATIVE ENVIRONMENTAL SOLUTION TO A MAJOR NAVIGATION AND FLOOD CONTROL CONCERN

At a bend in the Mississippi River, just above the confluence with the Ohio River, the stream flows in a broad sweeping reverse curve. This large meandering loop has created an agriculturally rich 10,000-acre peninsula-like area called Dry Bayou-Thompson Bend.

At first glance, this bend wouldn't appear to present any problems, but, over time, it experienced such severe erosion that the river began to scour a new channel across the peninsula. If an efficient solution were not soon found, a navigation crisis could occur. This 17-mile reach, if destroyed, would cause a break in the 2,300-mile navigation channel. A new channel across the peninsula could not support even the smallest tows, and the existing channel would be too shallow for navigation most of the time. Southbound traffic would halt above the bend, and northbound traffic from New Orleans could not progress north of Cairo, Illinois. The erosion was so severe that it also threatened the Commerce to Birds Point Federal Levee, which protects thousands of square miles of property.



A solution to this critical, unique problem required river engineering intuition, in-depth experience in hydraulics technology, plus a thorough understanding of the river and of all impacts of its changes. In addition, it was critical to establish a good working partnership with the farmers, landowners, and political interests who reside at or near the bend and whose livelihood depends on productive crops and the river's ability to transport those crops.

With resources scarce, St. Louis District could not dedicate a lot of engineers to this project. But about 14 years ago, the district's engineering managers determined that one man, hydraulic engineer Jerry Rapp could fill all the shoes. So, in addition to an already heavy project load, Rapp was assigned the difficult task of evaluating and developing a solution to the Dry Bayou-Thompson Bend erosion problem.

Channel development would be time-consuming and costly, so Rapp's mission was to develop a non-structural, environmentally beneficial solution to stop the erosion. Technology to resolve this problem did not exist, so Rapp rolled up his sleeves and began 14 years of trial and error and innumerable experiments. The Great Flood of 1993, the major flood of 1995, plus many other high water events caused setbacks, but also provided valuable opportunities to collect data and evaluate the work.

A support team assisted Rapp, with significant contributions by Sharon Wolf, Real Estate Division, and Dan Erickson, Riverlands Project Office. Many years of hard work resulted in a tree-screen/riparian corridor (a buffer strip of trees planted between the riverbank and the floodplain) now called the Thompson Bend Riparian Corridor Project.

The project includes cottonwood trees and other hardwoods specifically bred for fast growth and water-resistant attributes, and strategic placement of various other vegetation. The trees will be selectively harvested in an innovative arrangement with the landowners and local levee board so their shade does not prevent undergrowth. (A major side benefit is that it also provides timber as a cash crop for the landowners).

Consistent, continuing application, including ongoing tree planting, has maintained the river in its original channel, and navigation has been sustained around Thompson Bend.

This erosion control method has been so successful that Rapp has become recognized in developing vegetative solutions for a wide range of overbank and bankline erosion problems. This work is considered a prototype and is changing the way the Corps deals with severe erosion problems, while benefiting the environment.

Rapp's paper, "Preventing a Cut-Off of a Mississippi River Bendway with Tree Screens" was a finalist in the Permanent International Association of Navigation Congress competition, and was published in 1989. Work is ongoing and more tree screens are being established.

In a letter to the St. Louis District Engineer in November 1998, Lester Goodin, President, Buffalo Island/Thompson Bend Soil Conservation Association wrote, "The approach had never been attempted before, and it worked! It was recognized nationally and with State Conservation Awards. The Corps unfortunately seldom receives credit for such...hands-on management and knowledge as Jerry's. The



concept is structurally sound, environmentally proactive, and economically viable. And it is on the move. Thank you and all your staff. We have a truly exceptional working relationship to move into the future."

The idea worked far beyond expectations during the Great Flood of 1993. Even though about 40 percent of the trees were killed, they remained anchored in place. No one realized when they started, that a 100-foot tree screen

would cut flood velocities in half. Rapp and Goodin, using a Global Positioning System and Acoustic Doppler Current Profiler, measured flows going into the screens at about eight feet per second, and about four feet per second coming out. This led to far less erosion, increased deposition of sediment and eventual healing.

The tree screens planted in the original Dry Bayou high bank in 1986 held even through both the 1993 and 1995 floods. Tim Searchinger, Senior Attorney for the Environmental Defense Fund, told Goodin “this is a wonderful project, an ideal project, a credit to everyone involved.”

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INVESTIGATION OF DAM 24 TAINTER GATE VIBRATIONS

Lock and Dam 24 at Clarksville, Missouri has been operating for nearly 60 years. Routine maintenance has been performed to keep the project operating, but some of the project features have deteriorated beyond what routine maintenance can correct. In 1997, the St. Louis District prepared a major rehabilitation report to seek funding so these deteriorated features could be repaired. Two of the project features identified for potential rehabilitation were the dam tainter gates and dam tainter gate anchorages.



Side view of Dam 24 tainter gate

Sixteen tainter gates are used to regulate pool at Lock and Dam 24. Although the gates look somewhat similar to other tainter gates on the outside, the Dam 24 gates are rather unique structures. In order to minimize gate weight, the designers used an elliptical shell to form the main horizontal load carrying system. This makes the internal structure different than most tainter gates, which utilize a radial skin plate supported by horizontal girders. The 80 foot wide gates at Dam 24 were the widest tainter gates on the Mississippi River system of locks and dams until the 110 foot wide gates were built at Melvin Price Locks and Dam.

The Dam 24 tainter gates transfer the water load resulting from the elevation difference between upper and lower pool into the dam piers by means of riveted structural steel frames embedded into the concrete piers. To facilitate construction, the designers used welded plates to reinforce some of the connections on the steel frames. These plates are the source of the potential problem at Dam 24.

At the time the gates were designed, fatigue was not a major consideration in the design of steel structures. Fatigue is defined as cumulative damage caused by repeated fluctuating loads. Small imperfections in welded steel joints create tiny flaws that under repeated loading can eventually increase in size and lead to failure of the member. There has been a great deal of research done in the field of fatigue since the 1930's when the Dam 24 gates and gate anchorages were designed. Research has shown that the types of welded details used on the anchorage at Dam 24 are prone to fatigue cracking and eventually failure. The tainter gates themselves, which have riveted connections, have much better fatigue resistance than the anchorage.

Normally a tainter gate does not experience enough loading cycles of sufficient force to cause a fatigue problem, however the gates at Dam 24 are relatively light and wide which makes the gates prone to vibration. In addition, the bottoms of the gates have become damaged from debris and ice. It is



INSIDE A DAM 24 TAINTER

suspected that the damage causes flow conditions that intensify the vibrations. Under certain conditions, significant vibration of the tainter gates is easily seen. Gate vibration causes the gate anchorage to undergo fatigue loading.

The vibrations tend to occur under two conditions. The first condition is when there is high head on the gate, which occurs during low flow river conditions. The second condition that causes vibrations is when ice is passed beneath the gates. The personnel at the project must pass ice through the dam so that the ice doesn't gorge upstream of the dam and create excessive loads on the structure and also to create a clear zone upstream of the lock to facilitate passing tows through the lock. Vibrations of the gates and dam due to ice passage have been reported to be so severe as to shake the town of Clarksville. Low flow and ice passing vibrations could eventually cause fatigue cracking of the anchorage and loss of support for a gate.

As a result of recommendations in the major rehabilitation report, studies were funded to assess the magnitude of the fatigue loading on the gate anchorage. As part of these studies, strain transducers (small electrical devices that measure how much a steel member is stretching) were installed on some of the gate anchorages so that stress fluctuations during low-flow and ice passing conditions could be measured using the Structural Section's portable structural testing system. This system allows us to field test existing structures to determine operating stresses. The type of structural testing system we use was developed by Bridge Diagnostics in Boulder, Colorado to field test highway bridges in service. The system requires a structural engineer to go to the site, connect the structural testing system to the transducers, and conduct tests. With this system we could only capture a small percentage of the vibration events despite numerous trips to the site during low-flow and ice-passing operations.

Working with Bridge Diagnostics, we recently developed a new automated system that continuously records the stress fluctuations in two of the tainter gate anchorages. Using a "rain-flow" fatigue cycle counting process, the system counts the number of loading cycles at various stress ranges and saves the data locally. The system can be accessed directly from the District Office via modem to download the data for processing. This allows us to capture all the vibration events without having to actually be at the site. We can also perform "real-time" testing by changing the system settings via modem so that it continuously records stresses. For instance if we wanted to see what affect gate position has on the vibrations, we could telephone the project and ask the personnel at the project to change the position of the gates while we view the stress data.

I recently installed the new automated system with help from Pete Eschbacher and Ray Burrows from the structural section. Bob O'Shea, Bob Dien, Terry Meyers, and Dave Nulsen from the project also provided valuable assistance. With the recent "low-flow" river conditions, a good deal of data has already been collected. So far the data appears to show that our original assumptions concerning the



Upstream view of Dam 24 during ice conditions

magnitude of the fatigue stresses in the anchorage were fairly accurate, however the number of fatigue cycles may have been underestimated. We are continuing to collect and analyze the data to try to better determine the fatigue loading due to low-flow conditions.

The last few winters have been rather mild so no significant ice passing conditions have occurred so far (blame El Nino!). However with any “luck” we’ll have a “good” ice year and be able to come up with some conclusions concerning the fatigue loading on the anchorage due to ice passing operations.

Once we determine the fatigue loading due to the low-flow and ice passing operations we will know the fatigue demand on the anchorage. As part of the major rehabilitation investigations, other studies will be performed to better determine the fatigue capacity of the anchorage. A letter report that addresses both the fatigue demand and fatigue capacity of the gate anchorage along with recommended remedial measures will eventually be prepared. It’s estimated that remedial measures could cost up to \$11,000,000 if the investigations show they are necessary.

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ATOMIC WASTE REMEDIATION MISSION SUCCESS DESPITE UNUSUAL CHALLENGES

In October 1997, Congress transferred program execution responsibility for the approximately \$1.2 billion Formerly Utilized Sites Remedial Action Program (FUSRAP) from the Department of Energy to the USACE under the FY98 Energy and Water Appropriations Act. FUSRAP addresses primarily radiological contamination that was generated by uranium processing, assaying and disposal activities conducted on the behalf of the Manhattan Engineer District / Atomic Energy Commission (MED/AEC) during the development of atomic weapons in the 1940’s and 1950’s. The transfer of this high profile mission was unprecedented and gave responsibility for the remediation of five Missouri and Illinois sites to the St. Louis District (MVS).

While all the MVS sites are unique in their complexity and offer the project team an “opportunity to excel”, two sites have stepped to the forefront in the last year. The remediation of Plant 2 at the St. Louis Downtown Site (SLDS) was impacted by the discovery of a cache of Civil War era Confederate unexploded ordnance (UXO) while the Madison, Illinois site presented a much more conventional challenge - working at heights of 25’ to 60’. Fifty years after these sites served our nation’s effort in the development of nuclear weapons the sites now had one common element – both were active processing facilities that could not be impacted by FUSRAP efforts. The efforts and partnerships forged by the project team and the property owners ultimately resulted in the Corps showcasing its ability to maximize innovation in getting the job done.



IT bucket excavator operating on western boundary of Plant 2 excavation during night ops

SLDS UXO -- At the St. Louis Downtown Site (SLDS) the complexity of cleaning up radioactive soil within an active operating chemical plant, without impacting the property owner, was daunting. However, the stakes were raised for the St. Louis FUSRAP project team on 27 September 99 when three Civil War-era cannonballs were found in an open excavation at SLDS. This incident started a chain of events that led to a collaborative partnering effort between the property owner, local

government, two civilian contractors and personnel from multiple USACE organizations to accomplish a time-critical remediation of over 10,800 cubic yards of contaminated soil at the site.

After the discovery of the initial three cannonballs, USACE archivists set forth to unfold the rationale for how they arrived at a site with limited historical connection to the Civil War. Their research ultimately provided an answer. As the story goes, industrial manufacturing at the SLDS, located in downtown St. Louis, dated back to the mid-1800's. Using historical Sanborn Maps, which depicted the original site buildings from an 1875 survey, an earth floor foundry and adjacent pig iron yard (used to store "scrap" iron) was noted as part of the Buck's Stove & Range Company complex. Buck's, located directly under the footprint of the Plant 2 excavation, manufactured cast-iron stoves by melting scrap iron. It is surmised that after the Civil War, many weapons and munitions were decommissioned and sold as scrap iron from a nearby fortification. USACE experts speculated that the foundry purchased the iron in the rounds for use in manufacturing stoves. The fact that they were discovered fused

suggests that demilling procedures (removing the gunpowder and fuse prior to sale) were not practiced prior to the sale. Ultimately, the company buried the rounds that were not used in this process.



Recovered cannonballs and shells from excavation.

In 1935 Mallinckrodt purchased and demolished the foundry. A review of their archived company newsletter revealed that, they discovered and disposed of hundreds of cannonballs left over from the Civil War while building on the site. In 1941, Mallinckrodt began to erect buildings on that same site to support activities supporting the atomic bomb program during and after World War II. From 1942 to 1957, under contracts with the MED/AEC, plants located on SLDS were used for processing various forms of uranium

compounds, for machining and for recovery of uranium metal. From 1942 through 1945, uranium processing was conducted at in three locations on the site. One of these locations, Plant 2, was the first such area to be remediated. Little did the USACE know of the adventure that was ahead.

The FUSRAP team's first major excavation under the SLDS Record of Decision (ROD) was in Plant 2 area of the Mallinckrodt plant. A motivated project team consisting of the MVS project team, the property owner and the USACE Total Environmental Restoration Contractor (TERC), the IT Corporation, began its adventure. Typical of most excavations on a century-old manufacturing facility, the project team fought through challenges with weather, unknown utilities and other complexities while continuing to make good headway in completing the excavation on schedule. The excavation was shaped in a roughly circular manner, approximately 90ft by 60ft with excavation depths varying from 10 to 22 feet. Active process buildings bordered the excavation on two sides. As luck had it, most of the remedial effort in Plant 2 was complete when the initial three cannonballs were discovered near the base of the excavation. The unexploded ordnance was identified by a worker on-site in a pile of excavated soil in the southeast corner of the Plant 2 excavation. An ordnance expert identified these three munitions as a cannonball, a Brooke-type shell and a Parrott-type shell. After discovery of the UXO, manufacturing buildings adjacent to the excavation were shut down and evacuated by the property owner. Following coordination with USACE personnel, city authorities (bomb/arson, fire) removed the rounds and disposed them at an off-site location.

After the discovery of the cannonballs, a significant shift in focus became necessary to continue with the excavation activities. Concern about the protection of the operating plant and its personnel from explosive damage were a primary concern to both the USACE team and the plant ownership. In addition, local authorities were interesting in maintaining jurisdiction over any UXO operations. One thing that all parties agreed upon was that they wanted to ensure no additional munitions would be accidentally discovered. To address the concerns of all interested parties, experts from the USACE Center of Expertise on Explosive Ordnance Disposal (EOD) in Huntsville were asked to assist and facilitate coordination in the development of a revised remediation plan that would address USO removal safety requirements. Expert archivists from St. Louis District's Ordnance and Technical Services Branch researched the history of the area to determine the probable origin of the ordnance from while experts from Huntsville Center assess the danger posed by the explosives potentially in the excavation. This new plan assessed the remaining areas within the footprint of the former Buck's Stove Company to ensure the radioactive soil could be removed in an efficient and timely manner while maintaining a safe working environment for both the Mallinckrodt work force and the USACE project team.

Over an intense two-month period, remediation in the main Plant 2 excavation was halted while a plan was developed. Coordination between the St. Louis District's Ordnance and Technical Service Branch, the FUSRAP project team, Mallinckrodt management, and the Huntsville EOD team was intense as the criticality of the area to Mallinckrodt's commercial operations became apparent. Manufacturing operations in the immediate vicinity of the excavation produced over \$1 million in chemical products daily. Hence, the management team at the plant was extremely sensitive to any possibility of damage to foundations or windows which, if damaged would render these processes out of service.

In order to safely excavate the contaminated soil, a slow and deliberate process was necessary. The original minimum safety setback distance ranged from 700 meters to 1500 meters based on possible effects from blast overpressure. This safety zone was not feasible given the proximity of structures within the plant and the requirements to run an operating plant. A new minimum safe distance resulted from significant coordination between the Huntsville Center safety office, their remediation contractor (Sudhakar Company, Inc.), the site management, the property owner and the FUSRAP team. A safety zone of 80 meters was established as the minimum safe distance within which no unauthorized personnel could be present while UXO removal operations continued. In order to maximize both the time and efficiency available to the remediation contractor and ensure Mallinckrodt's production line could remain operational, IT and Sudhakar proposed a night operation scheduled from 7 pm to 5 am. This operating schedule coincided with a minimization of Mallinckrodt work force at night. Coordination meetings were to be conducted daily with all parties at the beginning and end of each work shift. As the plan was completed in late November 99, the end of the St. Louis construction season and the winter began to arrive.

Approval to proceed with the remediation plan occurred in the first week of December. Personnel from Sudhakar deployed to St. Louis to conduct ordnance removal and avoidance operations while IT continued the soil removal in Plant 2. The removal progressed very slowly thru December and January. A grid system was developed, marked and used as the tracking method for the removal. EOD personnel from both St. Louis District and Sudhakar checked the soil visually and with a magnetometer. This was done in 8-12 inch lifts prior to the soil's removal by IT. Each 20' by 20' grid square was evaluated and IT would then remove the cleared area and evaluate the area for radiological contamination. This symbiotic relationship necessitated a slow and deliberate effort. Soil was removed

at a pace of approximately 20-40 cubic yards per night (a significant decrease from the 100-150 cubic yard pace prior to the discovery of UXO).

The removal of the soil in the cold weather was further complicated by snow and ice during January. The stark cold in the middle of the night necessitated workers to rotate from the excavation following 15-20 minutes in the cold temperature. Despite these conditions, the project moved forward quickly and effectively, completing the remainder of the excavation in the Plant 2 quickly and without incident, discovering and removing almost 50 shells of various types and sizes. The actual remediation was less challenging than the synchronization required developing and approving a plan in a collaborative decision-making environment. The efforts during the operation were a striking example of a coordinated effort of the total USACE team could accomplish a goal in a difficult situation.

Madison -- On July 14, 2000 the MVS FUSRAP team accomplished a significant milestone, the decontamination of the Madison, Illinois FUSRAP site under budget and one year ahead of our schedule to Congress. The scope of the work involved the removal of contaminated dust from overhead beams that had been generated by one of the facilities previous during owner's support of our nations atomic weapons program in the 1950's on behalf of the Atomic Energy Commission (AEC). This was made possible by a total team effort, with each team player flawlessly executing their portion of the work. Notable contributions included: timely completion of numerous environmental documents by Science Applications International Corporation (SAIC), innovation in design and efficiency during the decontamination by the prime contractor, Arrowhead Contracting and the efforts of a dedicated MVS FUSRAP team. The facility decontamination, a culmination of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process, was completed 12% under budget and one day ahead of schedule. This percentage alone translated into over \$100,000 in savings for the taxpayer. As a direct result of Arrowhead's performance, a similar scale of savings was also captured for USACE and SAIC, who were respectively performing management / oversight and independent verification of Arrowhead's decontamination efforts.

This achievement was the product of one and a half years of hard work by a dedicated project team. MVS FUSRAP and contractor personnel repeatedly overcame seemingly endless obstacles and persevered to obtain resolution of numerous issues, ensuring the project could meet its aggressive schedule. For starters, several key environmental documents had to be published to complete the CERCLA process. A joint effort between USACE and SAIC, these defined the nature and extent of the contamination, determined a risk was present for utility workers and developed the criteria that USACE would use during decontamination. The documents developed in this timeframe consisted of: the Remedial Investigation, Feasibility Study, Proposed Plan (all supported by a Public Meeting) and the Record of Decision (ROD). Extensive coordination, to obtain concurrence on the environmental documentation, took place with HQUSACE, MVD, the HTRW-CX, the site regulator, the Illinois Department of Nuclear Safety (IDNS) and the site owner.



Decontamination workers using ladders, secured to the decking, reach contamination in the higher reaches of the Madison facility

After the ROD selected the final remedy for the site, Arrowhead, an 8a business, developed the Facility Decontamination Plan (FDP). The driving factor in the development of the FDP was that the

work needed to be accomplished during a 14-day window starting in late June. This window of opportunity was developed to accommodate the production schedule of the facility, thereby minimizing the economic impact that our work would have on their business operations. This “window of opportunity” was critical as the next available timeframe from the owner was FY01. The FDP called for Arrowhead to access affected overhead portions of the facility for the purpose of removing uranium dust on beams. To complicate matters, these beams were at heights ranging from 25 to 60 feet over the facilities main production line.

The scope and timeframe restrictions called for an aggressive, around the clock, 7 day a week operation. Arrowhead’s decontamination strategy consisted of using High Efficiency Particulate Air (HEPA) vacuums to remove the contaminated dust from approximately 60,000 lineal feet of overhead beams. After visual inspection of the facility, it was apparent that access to these beams was a major issue that could prevent them from completing the decontamination in 14 days. Deviating, via value engineering from the original FDP, Arrowhead developed an innovative approach that called for utilizing existing overhead cranes in the facility. These cranes were stabilized for decontamination workers by placing decking, manufactured at the facility, across the open, 12’ gap on the crane. This desk allowed them to expedite the decontamination of a significant portion of the site. The alternate approach, using manlifts to maneuver around the network of overhead power lines and beams, was extremely time consuming and labor intensive for the decontamination workers. The decking approach meant that the workers would have two 1600 square feet platforms for work, vs. the 25 available in the manlift. Higher areas (60’) were then accessed and decontaminated using ladders on the decking. This procedure also proved to be highly efficient as it allowed more workers (5 on the decking vs. 1 in the manlift) to conduct decontamination activities simultaneously.

Displaying great teamwork, they modified their schedule so that the verification contractor, SAIC, was also able to expedite their verification activities by using the decking on the platform. Building on these efficiencies, SAIC developed and implemented an innovative approach to verification. They placed rollers on the verification instrumentation and hooked them to extension poles from a local pool supply house. This modification allowed SAIC to scan the beams from the decking for lengths of 20 feet at a time rather than the 3 feet had it been done using traditional scanning methods by hand. This method of scanning the decontaminated areas to ensure the work effort met the criteria in the ROD resulted in SAIC accomplishing its verification one-day ahead of schedule.



Decontamination workers utilized man lifts to access certain areas of the facility. The streamers were placed on beams that had been decontaminated. Once the area was verified clean, a different color streamer was placed on the beam.

The innovations of Arrowhead and SAIC not only ensured the work was completed during the required timeframe, but also allowed both contractors to finish ahead of schedule and under budget. It should be noted that all workers overcame the intense heat of summer, which was compounded by working in an enclosed warehouse with no air conditioning. Factoring in the added risks of working at heights and in Personal Protective Equipment (PPE), their attention to detail resulted in a flawless safety record during the contract.

During the decontamination, 40 cubic yards of contaminated material, primarily uranium contaminated dust and PPE were collected. This material was sampled, packaged and placed in a rail gondola car that was shipped to an out of

state licensed landfill disposal facility. After this successful facility decontamination, team personnel have now begun the task of preparing the Post Remedial Action Report (PRAR), which documents the effectiveness of the decontamination effort against the standard set forth in the ROD. After the PRAR, MVS will begin site closeout procedures to remove the Madison Site from FUSRAP.

Finally, it is also important to note the dedication and contributions of the MVS FUSRAP team throughout the entire process. Team members set, and achieved, ambitious goals. Listed below are just a few of the accomplishments. First, the contract was developed and awarded by NWK in less than a month, an unheard of timeframe. The team decided that credit for this contract would be given to NWK to better position them to meet their small business contracting goals. Second, the entire MVS FUSRAP team spent numerous long nights, weekends and holidays answering questions to publish documents. Third, team personnel took on additional roles to facilitate completion of environmental documents and the decontamination. A few examples were: the Program Manager obtained authorization from Congress for an increase in funds in record time, a Project Manager became dual slotted as the Resident Engineer, an Engineer took on the site as an additional responsibility from her primary duties, a Health Physicist took over responsibility for radiation issues after another team member unexpectedly switched jobs, an Industrial Hygienist took time to assist in safety, transportation and disposal matters while on maternity leave. Real Estate gained access and Office of Counsel facilitated a quick resolution to all legal issues.

In sum, a total team effort at the Madison Site was orchestrated throughout all phases of work at the Madison Site. These impressive accomplishments reflect a classic case of the dedicated team members from MVS FUSRAP and its contractors, doing whatever it takes to get the job done.

Conclusion -- In executing the FUSRAP mission at the SLDS and Madison sites, St. Louis District's ability to get the right talent to the right place at the right time resulted in the achievement of optimal performance. In this day of scrutiny of costs, reductions in manpower and shrinking budgets, the team accomplished the mission accomplishment through the effective and efficient use of Corps wide resources. Our successes here have translated to "Corps credibility" with our project team, customers and regulators.

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PARTNERING REVITALIZATION

The St. Louis Metro Area Association of General Contractors (AGC) Missouri and St. Louis Chapters and the Southern Illinois Builders Association met with the St. Louis District Corps of Engineers in a Partnering Conference in January 2001. The conference was part of an initiative to revitalize the partnering concept between the Corps of Engineers and the construction industry. Both the Corps and the AGC were concerned that partnering was becoming "old hat" and was losing some of its luster and excitement.

In 1990, LTG H. J. Hatch formalized partnering in the Corps of Engineers. The idea was to create an atmosphere and mindset that encouraged dispute resolution through dispute prevention. LTG Hatch stated in his Policy Memorandum, "By taking the time at the start of a project to identify common goals, common interests, lines of communication, and a commitment to cooperative problem solving, we encourage the will to resolve disputes and achieve project goals." Over the past ten years partnering has been very instrumental in the success of numerous projects by establishing an

atmosphere of trust and candor in communications leading to a cooperative management team. Through the years it was felt that the newness and excitement of partnering had faded and action was needed to revitalize this important ingredient in project success.

The initiative began at the national level between the Corps of Engineers and the AGC at a meeting in Tampa Bay in 1999. This initiative was followed by a Regional Partnering Conference between the Mississippi Valley Branch and Mississippi Valley Division of the Corps of Engineers the following year. The local partnering conference held this past January is a continuation of this revitalization process. The conference was attended by approximately 50 participants and was co-chaired by COL Michael Morrow, St. Louis District Engineer, and Mark Schnoebelen for the AGC.

The Conference opened with the ratification and signing of a Partnering Charter that renewed everyone's commitment to Partnering both in concept and actively encouraging Partnering activities. The bulk of the Conference was then dedicated to open and candid discussions of items of mutual concern between the Corps and the construction industry. During the course of the conference the Corps was pleased to recognize Goodwin Bros. for the Outstanding Performance and Safety on their two contracts on the Ste. Genevieve Project. COL Morrow presented the awards to Larry Goodwin and his staff.

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FLOOD FIGHT TEAM TRAINING - 2001



Flood fighting is a total team effort, and not since the Great Flood of 1993 and then again in 1995 has the St. Louis District felt the exhilarating and heart racing experience of a flood fight effort. During the past eight years the Flood Fight Teams have gone through transitions of retirement and new recruits, which means little or no experience. Taking all the above into consideration and combining it with the hitch of changes in policy, new and advanced flood fight technology and decrementing funds, our Emergency Operations Center (EOC) felt it necessary to take action.

The result, Flood Fight Team Training 2001.

In an effort to assist Flood Team members in being more situationally aware and emphasize their major responsibilities and requirements, St. Louis District's Tom Brady, Natural Disaster Program Manager and Jake Scanlon, Chief of Readiness, developed an extraordinary one-day workshop.

The 27 March program, Flood Fight Team Training 2001, encompassed thought- provoking and detailed presentations from authorities on policy, levee integrity, under seepage, innovative designs, Geospatial Information Systems (GIS) and flood response efforts. The program concluded at the



District's Service Base, where participants obtained hands-on experience in the different methods of filling sandbags and putting their new found knowledge to the test by raising a levee and building sand boil levees. "The day was well worth the time and effort it took to coordinate this workshop", stated Tom Brady, "We've gotten the necessary information to our team members and some great suggestions to move forward with."

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AND JAKE SCANLON, CEMVS-CO-R, 314-331-8569*

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DEGENHARDT WINS TOP DOD VE AWARD

The St. Louis District continues to reap prestigious awards. Mr. Gene Degenhardt, the district's Value Engineer, has been recognized by the Secretary of Defense as the top Value Engineering Professional in the Department of Defense--the highest honor to be awarded a VE Officer in the Federal Service. A Certified Value Specialist (CVS), Gene has led the VE effort in St. Louis since 1982. He has been the coordinator and lead instructor for the Corps of Engineers worldwide Value Engineering training program since 1984. Gene has personally conducted over 140 workshops, studies and seminars, and taught over 2200 students, as he continues to be the leader for VE training in the Corps. He has developed many types of innovative and motivational teaching materials, which allows other VE professionals to tailor courses to both the ability of the audience and the time available. He is the developer of VE-trieval, the initial Corps information retrieval system, and serves on the prestigious Editorial Board of SAVE (Society of American Value Engineers) International's Value World professional journal. He has authored numerous papers and articles on VE, including, Concept Speculation and FACT – New Tools for the VE Job Plan, The Most Important Habit of Highly Effective People—Finding the Champion Within You; How to Think Like Leonardo DaVinci Using Covey's Seven habits; and Value Analysis of Arroyo Pasajero Flood Control Project, Performing Value Analysis in the Formulation Stage. He developed the Function Analysis Formulation Diagram (FAWD) for use in the value analysis of large projects in the formulation phase.



An internationally recognized member of SAVE International with Life status, Gene has served continuously as the liaison between SAVE and the Corps VE community where he has mentored numerous new CVS aspirants. Gene is the recipient of SAVE's International Distinguished Service Award, and has held numerous SAVE Board positions, including, Vice President- Membership; National Director – Construction Liaison; President, St. Louis Chapter; Chairman, SAVE Blue Ribbon Task Force; Director, SAVE International Steering Committee; and Member of the Year 2000 SAVE International Strategy Team.

Gene has taken the Value Engineering Program in the St. Louis District from infancy to the mature, highly successful program it is today. He has continued to nurture and develop the Corps of Engineers VE training program, which is SAVE-certified and is recognized as one of the best in the profession. He is one of the developers of the initial SAVE Internet home page. Gene has also worked in the capacity of VE for several other agencies and organizations, most recently conducting VE studies for the Bureau of Reclamation in California on the Arroyo Pasajero Flood Control Project, Tracy Fish

Facility Site Infrastructure Development. Such activities allow growth of both Corps programs and value methodology.

Gene is currently developing an outreach program for engineering students. This program, sponsored by the Pittsburgh District, which will allow college students to become acquainted with both Corps employment and the VE methodology, is expected to evolve into a Corps-wide undertaking.

Gene and other award recipients were honored 6 June at a Pentagon ceremony.

St. Louis District team members are well aware of Gene's always-positive outlook and his ability to motivate by making lemonade when he is handed a lemon. He is considered to be the most proactive and enthusiastic Value Engineering Officer in the Corps. His continued proactive effort has resulted in numerous successes, within and outside the St. Louis District. He led an inter-agency VE study for the Mechanized Infantry Training Center at Fork Polk Louisiana which resulted in reducing project cost while improving project functionality, thereby saving the project, critical to the overseas force readiness capabilities. This was an unparalleled success in getting various entities together to work for a common goal. Gene is also considered to be one of the best marketing tools within the Corps. By demonstrating consistent cost savings without decreasing value, he promotes an "on time under budget" image for the Corps. His external contacts have brought new work into the Corps while promoting the value methodology.

POC: MIKE HOLT, CECW-EV, 202-761-7751

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REAL LIFE SCIENCE 2001 -- AN EDUCATIONAL EXPERIENCE

On 2 May, the St. Louis District held its annual Real Life Science Exhibition at District Headquarters and the Service Base. Event objectives were to inform students of how their classroom studies relate to real life and how engineering and science technology impacts their daily lives. Engineering and other science disciplines were well represented and everyone left with a greater understanding of real life technology and a renewed inspiration to learn. Some students accompanied parents, some groups were class field trips, and a scout troupe even earned a merit badge by participating in the event. Engineers and scientists from all over the District participated in the event, which again proved its worth as an educational and community outreach activity. Among the most popular of our many interactive displays and presentations is the bridge building activity. After receiving instructions from engineers, the students physically construct and test a bridge. They then reinforce their new knowledge by using a computerized bridge-design, construction, testing and repair activity. In addition to the many engineering presentations, the District presented many lessons in natural resource management, water-safety, and the historical and cultural responsibilities all citizens must practice.



Since a picture truly is worth 1,000 words, the following depicts just a small sample of Real Life Science 2001.

Guests sign in and pick up their informational Welcome Packets at the Registration Desk

Students, teachers and presenters anxiously wait the start of the show



Hydraulic Engineer Dennis Stephens uses a lock model to explain the locking process

After locating the “radioactive” items with a Geiger counter, future remediation specialists are instructed by FUSRAP Project Assistant, Jacque Mattingly in the removal and handling of HTRW



The determination to build a bridge shows on the face of this future engineer.

Civil Engineer Deanne Strauser oversees construction.



Structures Chief, Tom Quigley provides a brief explanation of the computerized bridge design, construction, test and repair program.



The Geospatial Engineering staff teaches computerized map-making. Everyone leaves with a map of his or her own creation.

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AUTOMATED PERFORMANCE MONITORING OF DAMS

The Center of Expertise for Automated Performance Monitoring of Dams (C-APMD) was established in the Geotechnical Branch, Engineering Division, St. Louis Engineer District in 1995 to maintain state-of-the-art expertise in the areas of planning, design, contracting, and use of instrument systems and the transmission and management of instrument data. The Center continues to possess the capability to support the critical mission of assuring the safety of dams and the protection of the public. This responsibility is prevalent throughout the civil works and military commands within the Corps of Engineers.

The Center provides advisory assistance and design services to all USACE elements and assists HQUSACE in development of R&D, program guidance, technology transfer, and criteria documents. The primary objective of the Center was to assure the safety of dams as districts lose institutional knowledge of the design and performance of complex and aging structures and deal with declining resources. HQUSACE recognized that all organizations will face these changes at some time and that all elements with dam safety responsibilities could not practically obtain or develop the expertise of the specialized technology required. This objective has proven to be on target. The Center assists more than a dozen districts annually with some aspect of data management and/or instrument system reassessments and upgrades. We coordinate with other agencies, professional societies, and the private sector to maintain a perspective of the industry and share information. Center representatives make presentations at seminars, conduct workshops and instruct at PROSPECT courses.

Dam safety functions, the nature of the missions for flood control, navigation support and coastal protection is characteristically unique to the Corps of Engineers. The Corps is the only organization

that is owner, operator and self-regulator of major water resource structures. Monitoring and evaluation of the performance of these structures are an integral part of our corporate culture. The behavior of each structure is characteristically unique and applications of monitoring technology are case specific. In-house expertise commensurate with Corps philosophy and integrated with project-specific technical knowledge adds value to the mission. The St. Louis District's Geotechnical Branch possesses the necessary broad range of expertise that needs to be applied in non-standard ways to solve unique problems.

Advisory assistance is available to determine the use of resources, methods of procurement, and overall approach to a specific project, all of which have proven to be critical to the success of automating instrumentation. In addition to the free advice, the following services are offered on a reimbursable basis:

- Assess performance and reliability of existing instrument and data management systems
- Plan, design, layout, integrate new instrument and data management systems
- Develop plans and specifications for contract
- Review designs, plans and specifications by others
- Manage instrument data to assure protection of historical information, prompt processing of raw data, prompt input to engineering evaluations
- Develop approach to evaluate the parameters that are critical to safe performance of water resource structures
- Troubleshoot, test, maintain and recalibrate automated and manual instrument systems
- Develop Corps-wide guidance and directives
- Conduct research and development as appropriate
- Conduct training and workshops

A variety of sources of expertise are available to accomplish the work, each with thorough knowledge of Corps guidance, industry standards, and lessons learned from previous applications. These sources of expertise reflect the philosophy of the regulations developed for the automation of instrumentation and results in responsiveness to the customer.

The C-APMD is the knowledge base for automation work done by the Corps of Engineers nationwide and for all automation done by others, public and private. It is the USACE-designated POC for the support of the data management software, WinIDP. The Center is the first alternative to perform automated dam safety monitoring duties as workload permits. Primary POC for the Center is Jim Brown (james.c.brown@mvs02.usace.army.mil), 314-331-8410.

Several other Corps districts have experience in various aspects of automating instrumentation and are also actively involved in performing Dam Safety work. The Instrumentation Systems Development Division of the U.S. Army Engineer Research and Development Center in Vicksburg MS is the focal point for all Corps of Engineer seismic monitoring in the eastern 2/3 of the U.S. This organization also has experience installing some types of dam safety automation, extensive experience with a variety of research and investigative monitoring applications, and is networked with Corps laboratories and other facilities nationwide.

HQUSACE suggests the use of a specialized consultant capable of responding to any Corps monitoring need in the country in the event that other sources of expertise are not available. Since 1995, the

Center of Expertise at St. Louis District has administered an Indefinite Delivery/Indefinite Quantity Contract to meet this need. The current contractor is URS Corporation, whose nationwide offices of the former Woodward-Clyde Consultants are industry leaders in automation of monitoring systems. This contractor expertise is committed through the summer of 2004.

Entrepreneurs and manufacturers with new products and concepts frequently approach representatives of the Center. Sometimes they are seeking pilot applications. Sometimes they are receptive to modifying their ideas if they can address Corps problems. We are very interested in how O&M dam safety functions might benefit from ongoing and future R&D programs in the areas of monitoring condition assessment, documentation and information management. We have been communicating frequently with other experts on this subject and exploring possibilities during the past several months.

The Center of Expertise for Automated Performance Monitoring of Dams is available to assist if you have dam performance assessment challenges, new opportunities or year-end money, but no time to develop your own project or procure services. Please keep me apprised of your needs, successes, and failures so that we can maximize the use of available resources and work efforts for the benefit of Corps Dam Safety.

POC: JIM BROWN, CEMVS-ED-GE, 314-331-8410

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ACCESS DAM SAFETY PERFORMANCE DATA QUICKLY AND EASILY TODAY AND THROUGHOUT THE FUTURE WITH WINIDP

WinIDP integrates data from a variety of manual and automated sources into a seamless database, which enables dam safety monitors to assess status in a quick and mobile fashion. Some of the more significant features of WinIDP include: user-defined input formats, compatibility with automated systems by Geomation, Campbell Scientific and hand held data devices, user-defined reports and plot formats, batch plotting, simple and versatile editing of constants and data, accommodates any windows supported printers and plotters, and it is ODBC (Open Database Connectivity) compliant.

WinIDP was developed for Corps-wide use by the WES Committee on Computer Applications in 1990. A survey was conducted of the needs of all districts and of the various software in use at that time, and survey results were used to develop software specifically for assessing the performance of dams. The Instrumentation Database Package is available at no additional cost to Corps users. Conversion to the windows environment was accomplished in 1996. The St. Louis District was appointed the point of contact for this system in FY 97 by HQUSACE and assures maintenance of WinIDP.

When comparing the cost of creating software for specific needs or using commercially available programs, such factors as support, reliability, longevity, flexibility, enhancements, integration, database conversions, and training can be accomplished through the St. Louis District on a cost reimbursable basis. The best part is that all users benefit from any improvements made by anyone and typically can be cost shared. Many improvements have been made. The most notable are the addition of the Grapher plotting interface and conversion of WinIDP from 16 bit to 32 bit. The Grapher interface is a more advanced graphing program that can fill in some gaps for Excel's shortcomings. The 32-bit conversion made the program much more stable on the Windows 95, 98 and NT operating systems.

FEATURES of WinIDP:

- Utilizes a simple interface to enter and plot data
- Four security levels can limit access to databases
- Share data and plots with in-house staff and consultants through network and Internet
- Easily assess limitless data readings through time series, positional or correlation plot formats
- Choose your preferred Plotting program; Excel version 5.0c, 95, 97, and 2000 or Grapher
- Generate plots through any windows supported printer (even color and 11"x17")
- Add CADD drawings, scanned images, pictures, data tables to data plots to aid review
- Easily generates hundreds of data plots with no user interaction through batch plotting

Minimum PC System Requirements:

Processor Type: Multimedia PC with Intel® Pentium® processor

Processor Speed: 166MHz

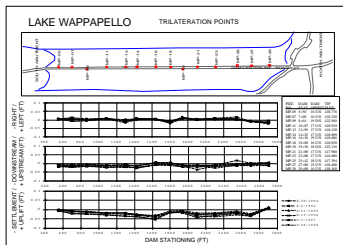
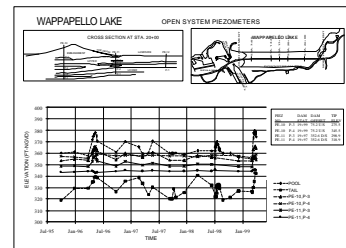
Operating System: Windows 95/98/2000/NT 4.0 with Service Pack 6a or later

System Memory: 32MB RAM for Windows 95/98 64MB RAM for NT

Hard Drive Space: 500MB

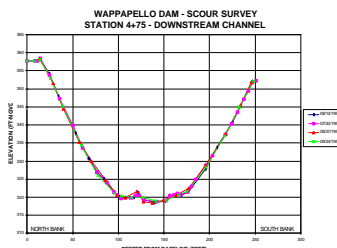
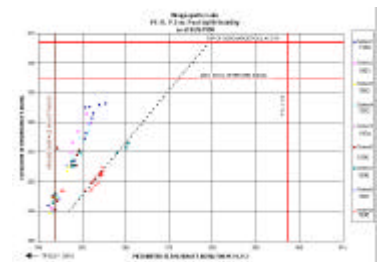
FEW EXAMPLES OF THE MANY PLOTS THAT CAN BE CREATED BY WinIDP

Time Series – Displays pressure or movement changes over any prescribed range of time and at any time interval. For instance, one month may be appropriate for higher frequency automated data or thirty years for movement since impoundment.



Positional – Movement data is related directly to fixed points on the structure. Multiple plots on one page allow analysis of all dimensions at once.

Correlation – Displays a relationship between an instrument and any other instrument or parameter. Could be used to determine hydrostatic pressures by relating piezometric pressures to pool elevations.



Positional (Variable) – Movement data is displayed at the variable interval it is acquired, as with scour surveys. The offset interval of the X value is linked to a data value instead of a fixed constant.

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POC: TRAVIS TUTKA, CEMVS-ED-GE, 314-331-8413

REAL ESTATE'S ROLE IN PROJECT DELIVERY

As a team based organization, the US Army Corps of Engineers relies on a wide variety of professional disciplines in the project phases of planning, development and management. Real Estate is an integral component throughout the entire project life cycle. In the St. Louis District, the Real Estate Division provides technical team members who work closely with Project Managers, Operations Managers, design engineers, non-Federal sponsors, the general public and many others. Real estate products and services primarily involve the acquisition, management and disposal of real property.

Civil works projects from non-structural to structural solutions typically require certain interests in real property. The effective provision of project right of way services depends on teamwork; and contributes significantly to the Corps' ability to serve the Army and the Nation. St. Louis District project delivery teams, led by Project Managers and Operations Managers, include Real Estate members who contribute to the successful implementation of the Project Management Business Process. Project planning and development involves early and active engagement of the Real Estate team members to develop real estate plans; acquire temporary rights of entry for surveys, borings, archeological and environmental investigations; advise non-Federal sponsors; inform affected landowners; and acquire the necessary permanent realty interests prior to project construction or implementation.

Real Estate management of the title to real property is an important responsibility for water resource projects that are Federally operated and maintained. Real Estate, in cooperation with Operations Managers and others, provide opportunities to utilize project land and water resources for a multitude of purposes and needs. Federal real property inventory and accountability responsibilities have been delegated to Real Estate to ensure compliance with the Chief Financial Officers Act. In addition, if any real property interests are no longer required for project purposes, it is Real Estate's responsibility to dispose of these assets.

Real Estate team members are primarily Realty Specialists and Appraisers who are supported by attorneys, contract appraisers, title companies, survey and mapping experts, budget analysts and other administrative assistance. This cadre of real estate expertise is comparable to similar staffs maintained by railroads, utility companies and highway departments as well as private sector organizations. As a group of real estate professionals, they are uniquely trained to address the realty requirements associated with the diverse spectrum of water resource development programs and projects and other engineering missions assigned to the St. Louis District.

POC: TOM HEWLETT, CEMVS-RE, 314-331-8150

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Update

MSC E&C CHIEFS MEETING

A meeting of MSC E&C Chiefs was held on 2-3 May 2001 at Ft. Belvoir, VA. Over 40 people from the field and HQUSACE attended, representing all MSC's and a number of Districts. There were presentations, discussions, and demonstrations on a wide variety of hot issues and ongoing programs. Presentations from the meeting are available under the "Recent News and Events for Engineering and

Construction” tab on the CECW-E homepage (<http://www.usace.army.mil/inet/functions/cw/cecwe/>). A list of action items that emerged from the meeting follows.

- Develop regulation on jobs requiring Professional Registration, tied to responsibilities rather than specific job titles that constantly change. (ACTION: Andy Constantaras, POD / Ray Navidi, HQ)
- Review military and civil works metrication policy. Interest in metrication appears to be limited by sponsors and customers. In most districts designing in metric, the contractor converts and builds in inch-pounds; contractor provides metric as-builts, but customer/sponsor wants as-builts in inch-pounds. (Bob Fite, HQ)
- Add "Upcoming Regional and National Meetings and Conferences" item to monthly E&C News. (Charles Pearre, HQ)
- Establish E&C Chiefs e-mail lists for distribution of information, including job opportunities for staff. (Charles Pearre)
- Forward to Dwight Beranek e-mails / letters from people who turndown USACE jobs due to burdensome personnel practices. (All)
- Evaluate options to reduce delays in recruitment and hiring, and increasing number of technical GS-13 positions as appropriate. (Dwight Beranek, HQ)
- Delay / review ongoing and planned seismic liquefaction dam safety studies and remedial projects to ensure incorporation of results of breaking state-of-the-art seismic research on depth of materials susceptible to liquefaction. Develop / issue implementing guidance. (Mike Klosterman, HQ)
- Arrange for next MSC E&C Chiefs meeting, to be held in approximately 6 months. (Louis Carr, MVD)
- Issue Policy Memo reinforcing the requirement to utilize RMS for all Construction contracts. [Action pending completion and testing of Contractors QC module and SPS/PD2 interface.] (Brad James, HQ)
- Reevaluate A-E and Design Build "targets". Consider workforce quality (expertise) impacts of these decisions. Determine appropriate, consistent metrics. (Don Evick / Charles Pearre/ Mark Grammer, HQ)
- Assess technical expertise needs in USACE. Determine metrics for "quality" of technical expertise? Is Centers of Expertise the answer? (Ray Navidi, HQ)
- Publish meeting summary and action items in E&C News. (Bob Bank, HQ)
- Input to WRDA 2002 to Raleigh Leef (Bob Bank POC, All)

POC: BOB BANK, CECW-EWW, 202-761-4243

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JOHNSTOWN: DISTRICT LIVES UP TO ROOSEVELT'S PROMISE

Like siblings, the history of Johnstown, Pa and the Pittsburgh District have been intertwined since President Benjamin Harrison directed the U.S. Army Corps of Engineers to assist recovery efforts following the disastrous South Fork Dam flood of 1889.

Major floods in 1936 and 1977 added to Johnstown's distinction as the American city most infamously associated with flooding. Shortly after the 1936 flood, President Franklin Delano Roosevelt promised the citizens of Johnstown federal flood protection. Congress followed with legislation making Johnstown one of the few local protection projects that remains a federal responsibility.

In 1943, District Engineer Gilbert Van B. Wilkes dedicated the original Johnstown Local Flood Protection Project, telling the audience "Today, Johnstown can boast that it has the largest and best channel improvement in the United States."

The project was designed to contain the flow of the 1936 flood in Johnstown along the Little Conemaugh, Stoneycreek and Conemaugh rivers. It was constructed in six units consisting of approximately nine miles of channel widening, deepening, concrete paved channel side slopes and 8,700 feet of concrete walls.

Another 17,000 feet of privately owned walls already provided flood protection, were structurally reliable at that time and, because it was considered good economic sense, were incorporated into the Corps project.

In 1991, Congress authorized use of both construction general funds and operations and maintenance funds for the major rehabilitation of the Johnstown local flood protection project.

"Since the beginning, rehabilitation of the Johnstown project has presented the district with unique and complex challenges testing the ingenuity and dedication of the project team members," according to Mike Rattay, project manager for Johnstown.

Carmen Lebder, lead engineering team member, adds one complexity was that the 1991 legislation gave the district first time authority to evaluate the condition of the privately owned floodwalls.

Dave Heidish, another key engineering team member, led a team that inspected the project in the early planning phase, including the privately owned walls. Heidish is also responsible for the engineering and design on two of the major construction contracts.

From his perspective, the project is unique because of "the design challenges, whether they be at locations where existing masonry wall foundations supported buildings or existing deteriorated concrete walls also happened to support active utility lines. You never discovered the same conditions anywhere in the project.

"Every little wall section had to have a different and unique solution. Some of the solutions varied from stabilizing building foundations with tie-back rock anchors to constructing new concrete gravity or cantilever walls or refacing some walls with eight inches of concrete.



"In one area, to address existing erosion, we are reusing large excavated masonry units by placing them in the channel as an overlay layer to prevent future erosion."

Other factors effected engineering and design efforts.

For example, at public meetings with the property owners, many questions were raised on the impact of the construction work on their buildings, their businesses and their parking areas. Team members explained construction plans in detail, answered many business concerns and took the extra effort to phase construction of several parking areas to minimize the dollar impact to the city and property owners. Both were extremely satisfied with the results.

The unique designs and construction agreements with individual property owners also affected real estate acquisition. Using the district's local area network computer link, the real estate technical resources team was able to quickly share new information like legal descriptions and estates. A coordinate geometry software program allowed the team to make real estate changes quickly, saving time and money.

"We seamlessly worked changes into the landowner negotiation process so that landowners were not surprised and understood technical changes," real estate key team member Roger Wood said.

The real estate team also worked at length with the project manager on two complicated Project Cooperation Agreements and other necessary memorandum of agreements for real estate resulting in a smooth execution of those documents and a satisfied customer.

Part of the project's complexity and innovative responses involved historic and environmental compliance requirements. The privately owned masonry walls and other structures incorporated into the federal project, as well as the project itself, were determined to be historically significant. The team also identified the potential for historic period archaeological sites along the wall segments to be replaced.

Team members worked together to word construction contracts clearly defining time frames and construction support requirements for archaeological monitoring.

Planning team member Conrad Weiser also applied innovative cultural resource contracting procedures to minimize the time required for archaeological excavations and eliminate payment for unneeded services should no archaeological materials be found. As Weiser indicates "this resulted in significant cost savings over traditional contracting procedures and in no delays to date having completed four of the five monitoring locations".

The city of Johnstown is an integral member of the project delivery team with the opportunity to review and comment on all project decision documents and contract solicitations and to take part in all pre-final construction inspections. One outcome of their review was a request to add mooring rings and safety ladders, which will assist them in responding to river emergencies.

"We have also partnered with all of our contractors," construction team member Ralph Henry said, "and the city has attended all contract partnering sessions".

Partnering has also been important in the team's successful interaction with local industries whose facilities have been affected by the rehabilitation project and other agencies, such as the Pennsylvania Department of Transportation (PADOT), the Pennsylvania Historical and Museum Commission and the Johnstown Redevelopment Authority.

Rattay offered two specific examples of partnering success.

At the city's request, the team replaced 2,352 feet of a concrete balustrade safety wall parallel to the main highway into town under a PADOT road-resurfacing contract. This reduced traffic restrictions from two construction seasons to one. The team accomplished through a relocations agreement with the city that entered into a third party agreement with PADOT.

Local interest in a recreation trail on newly acquired project lands led to a congressional request and team review of the district's authority for such work. The result was appropriation language adding the Urban Greenway Trail to the rehabilitation project. It is included as an awardable option to an ongoing construction contract and could be built in 2001.

Total rehabilitation cost is estimated at \$41 million with \$27 million expended through FY2000.

Four major construction contracts totaling \$24.3 million have been awarded. Two contracts are completed: Mosites Construction Co. in Units 5 and 6 for \$6.4 million and Robert Charles Enterprises in Unit 3 for \$2.4 million. The two current contracts scheduled for completion in 2001 are with Brayman Construction Company in Unit 3 for \$5.7 million and Robert Charles Enterprises in Unit 4 for \$9.8 million.



The remaining two construction contracts are for work in Units 1 and 2 and a final cleanup through all six units. Work could begin in fiscal year 02 and finish in fiscal year 2003 depending on operation and maintenance fund availability.



One measure of the Johnstown team's success in meeting the project challenges and customer expectations is its recent selection for honorable mention as Project Delivery Team of the Year, a significant award in that the Johnstown team was the only civil works team honored at the recent U.S. Army Corps of Engineers Project Delivery Team Conference. Thirty-six project team members were included in the award nomination including three from of the city of Johnstown.

"Some team members remind me of our team's success occasionally and that a party is long overdue," Rattay said. "The worst part is we all know the real party, working together for so long on the project, will eventually have to end".

POC: CARMAN LEBDER, CELRP-ED-DG, 412-395-7284

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THE ENGINEERING AUTOMATION RESEARCH UPDATE

The third edition of the Engineering Automation Research Update (The "EAR") is now on the Internet at <http://www.cecer.army.mil/EARUpdate/Index.cfm>. U.S. Army Engineer Research and Development Center offers this service three times a year. Its purpose is to keep the U.S. Army Corps of Engineers community informed about ongoing research to improve the facility delivery process. Our target audiences are those involved with planning, designing, and building military and federal facilities.

EAR updates are distributed free on a subscription basis. If someone forwarded you this message, and you wish to continue receiving these updates, please go to the EAR web site and follow the directions to subscribe at <http://www.cecer.army.mil/EARUpdate/ToSubscribe.cfm>. The EAR welcomes correspondence and contributed articles.

Highlights of the current issue include:

- **The Facility Engineering Framework for Engineering Collaboration** by Dr. Michael P. Case (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/PCAv2.cfm>)
- **Improving Design Communication -- Visualization Study** by Blessing Adeoye (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/VS.cfm>)
- **The Zen of DENIX: DENIX WebSearch** by Todd R. Littell (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/DSE.cfm>)
- **Sliding Snow Calculator** by James Buska (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/Sliding.cfm>)
- **New Software Helps Reduce Building Energy Use** by Linda K. Lawrie (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/EPF.cfm>)
- **EnergyPlus(tm) Interoperability: Acquisition of Building Geometry from IFC-Compatible CAD Tools** by Rob J. Hitchcock (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/EPI.cfm>)
- **New Sustainable Design and Development Web Page** by Annette L. Stumpf (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/SDnDArticle.cfm>)
- **Sustainable Family Housing** by Brian M. Deal (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/SustainableFamilyHousing.cfm>)
- **DrChecks Enterprise Edition** by Bill East (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/DrChecksEEA.cfm>)
- **Energy Manager Project Assistant (PA)** by Elisabeth M. Jenicek, Donald F. Fournier, and Aide Uzgiris (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/EMPA.cfm>)
- **IAI Update** by Dr. Francois Grobler (<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/IAIUpdate.cfm>)
- **Recent News Items** (<http://www.cecer.army.mil/EarUpdate/NLFiles/2001/RNI.cfm>)

"**The Facility Engineering Framework for Engineering Collaboration**," explains the big picture view of how CAD, GIS, and architectural and engineering applications will use "objects" and be able to exchange data using eXtensible Markup Language (XML). It discusses on-going international standards efforts, and research being done to enable engineering collaboration that takes into account the facility, the process, and the needs of people who are collaborating. See the article at: <http://www.cecer.army.mil/EARUpdate/NLFiles/2001/PCAv2.cfm>.

"**Improving Design Communication -- Visualization Study**," provides a general overview of design communication from the perspective of building design process, specifically in the context of engineering and architectural design. It explored how architects and engineers use visual media to effectively communicate design ideas to their customers and other design team members. Results of the study are described in an ERDC/CERL Technical Report. See the article at: <http://www.cecer.army.mil/EARUpdate/NLFiles/2001/VS.cfm>.

"**The Zen of DENIX: DENIX WebSearch**," describes a powerful new search engine that allows users to do full-text searching of DENIX and 55 related web sites. DENIX, the [Defense Environmental Network & Information eXchange](http://www.denix.osd.mil/) <<http://www.denix.osd.mil/>> is a DoD web site that provides timely

access to Environment, Safety, and Occupational Health (ESOH) information. See the article at:
<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/DSE.cfm>.

"Sliding Snow Calculator," talks about CRREL's newest development, a sliding snow calculator to predict the potential impact zone of snow and ice sliding off slippery roofs. It can be used to properly locate entrances, walkways, and driveways to avoid these hazards. See the article at:
<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/Sliding.cfm>.

"New Software Helps Reduce Building Energy Use," discusses EnergyPlus(tm) a new generation building energy simulation program that allows architects, engineers, building owners and managers to minimize energy use and cost, and optimize building performance by simulating building energy use. The article also explains how to obtain EnergyPlus(tm) free. See the article at:
<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/EPF.cfm>.

"EnergyPlus(tm) Interoperability: Acquisition of Building Geometry from IFC-Compatible CAD Tools," describes a new software utility which imports IAI (International Alliance for Interoperability) IFC-based geometric representation of the building envelope from an IFC-compliant data file and generates an EnergyPlus(tm) input file. Read about it at:
<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/EPI.cfm>.

"New Sustainable Design and Development Web Page," describes CERL's new website, intended to help the Army and USACE Districts plan, design, build, and operate facilities in a sustainable manner. It contains guidance to help people comply with current sustainability criteria and has links to case studies, policy, training resources, important conferences and events, and the best sources of available information. <http://www.cecer.army.mil/EARUpdate/NLFiles/2001/SDnDArticle.cfm>

"Sustainable Family Housing: The Green Neighborhood Process" describes a collaborative approach to provide responsive solutions for the complex problems related to a residential development including; environmental, energy, maintenance and associated cost issues. The Green Neighborhood project was developed in response to the need for greater energy and environmental awareness in the planning, development and operations of family housing facilities at military installations. Read the article at:
<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/SustainableFamilyHousing.cfm>

"DrChecks Enterprise Edition" discusses the upcoming version of DrChecks. This new version represents our move from an individual 'site' perspective to a cross-agency enterprise project collaboration platform. Read the article to learn about new DrChecks Enterprise Edition features.
<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/DrChecksEEA.cfm>.

"Energy Manager Project Assistant Software Program" calculates resource and cost savings and generates DD1391 project documentation forms and supporting economic analyses. The program prints an economic analysis summary sheet and list of input data and assumptions that can be included as part of the supporting documentation. The PA software and instruction manual are available free.
<http://www.cecer.army.mil/EARUpdate/NLFiles/2001/IAIUpdate.cfm>.

"International Alliance for Interoperability (IAI) Update" contains a short PowerPoint status report indicating which commercial software vendors are becoming IAI IFC (Industry Foundation Class)

compliant. The show describes current IAI projects and Release 2X capabilities. View the update at: <http://www.cecer.army.mil/EARUpdate/NLFiles/2001/IAIUpdate.cfm>.

"**Recent News Items**," links to recently published articles and interesting websites. New sidebar buttons include "Current Events", "AEC Technology Links", and "Technical Reports". See the article: <http://www.cecer.army.mil/EARUpdate/NLFiles/2001/RNI.cfm>.

We hope you will find this to be a valuable resource. Thank you for reading the Engineering Automation Research Update (EAR Update)!!!! We look forward to seeing you on the Web! <http://www.cecer.army.mil/EARUpdate/Index.cfm>. This article with all the links is also accessible through the ERDC/CERL Home Page site by following these 3 steps:

1. <http://www.cecer.army.mil>;
2. Click on Technical Domains: Facilities;
3. Click on What's New - Engineering Automation Research Update.

We're always interested in what our readers are thinking. Send ideas, suggestions and comments to Annette Stumpf, Editor, Engineering Automation Research Update.

POC: ANNETTE STUMPF, CEERD-CF-N, 217-352-6511, EXT 7542

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CONSTRUCTION CAPABILITIES SURVEY

One of the Corps' central missions is to deliver quality construction to our customers. We depend upon top-notch construction talent to ensure we meet these expectations. Significant changes in business process, acquisition methods, and the overall construction industry have occurred in the last decade. Examples of these changes are the adoption of the Project Management Business Process and Regional Business Centers and the expanded use of design/build contracting. We expect change in the construction field to continue and perhaps accelerate. These processes and industry changes may require some fundamental changes, as well, in the competencies of our construction personnel in order to succeed on Project Delivery Teams and to maintain construction quality standards. Coincident with these changes, the Corps, along with many other federal agencies, can expect high turnover in personnel due to retirement for the next decade. It is essential that we address these converging trends in order to maintain our ability to perform our construction mission in the future. The Corps needs to maintain a world-class construction oversight capability. To that end, we are performing an assessment of USACE construction technical capabilities culminating in a report of findings and recommendations to the Chief of Engineers. This assessment will evaluate current and future capabilities top to bottom (i.e. Headquarters, Divisions, Districts, field offices, labs and CX's).

Mr. Stuart Houck, formerly Chief of Engineering and Construction Division, Japan District and now in CECW-ET will lead a small task force to accomplish this assessment. Mr. Don Basham, Director of Planning and Programs Management at Mississippi Valley Division, will perform executive oversight of this task. The other team members include Terry Wilford, CECW-ETC; Jim Ditto, MVD; Mike Abeln, SAM; Cindy Baksys, SPK; Michael Bevens, NWS; Lisa Billman, SWF; Farrell McMillian, NAE; Jim Moore, NAB; Harvey Robinson, POJ; Richard Schipp, LRL, Michael Stout, MVK.

A kick off meeting was held 7 & 8 May 2001 in Washington, DC. At that meeting the Project Management Plan was prepared. It was decided that the easiest way to get the maximum input from the field and district personnel was to draft a questionnaire to be placed on the web for their responses. The questionnaire was drafted and has been beta tested and should be available for your input by mid

June 2001. All personnel are requested to respond to this questionnaire. It is the best way for you to get your ideas listened to.

The assessment team will also coordinate with our partners in the construction industry for their input to the analysis. This will include the AGC, ABC, NSPE, ASCE, CIMA, CII and others. When the questionnaire has been analyzed the team will meet and draft a report for the Chief of Engineers. This report will recommend actions that need to be taken to assure that we have the properly qualified personnel in the correct numbers to meet our existing responsibilities and future anticipated responsibilities in the construction arena of the project management business process.

POC: TERRY WILFORD, CECW-ETC, 202-761-7284

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Dam Safety

DAM SAFETY 2001 AND CORPS DAM SAFETY SEMINAR

The Association of State Dam Safety Officials (ASDSO) will hold their annual conference 9-12 September 2001 at Snowbird Resort, Snowbird Utah. The Corps of Engineers will hold a one-day seminar on 13 September 2001 at Homewood Suites, Midvale, Utah. We have arranged for rooms at Homewood Suites at the Government Per Diem rate.

ASDSO invites all those interested in the latest policy and technical information concerning dam safety in them and to attend Dam Safety 2001. Twenty-one technical sessions, an abundance of networking opportunities, and a truly inspiring mountain vista will make this one of the best conferences of the year. Dam Safety 2001 provides an outstanding return on your investment. Each full conference registration includes:

- More than 24 hours of educational instruction conducted by experts in at least 15 technical fields.
- Opportunities to network with over 600 dam safety professionals from the U.S. and several foreign countries
- A complete resources packet, including the Conference Proceedings on CD Rom, the participants list, an ASDSO Year-In-Review Newsletter, and an updated report on the Annual Survey of State Dam Safety Programs.
- Admission to all conference technical sessions, exhibit show and catered events.

This year's field trips features both technical tours of well-known area dams, and a special side trip to tour the 2002 Winter Olympic Park in Cottonwood Canyon. You get to choose from two itineraries: Tour 1 includes stops at the dams and the Olympic Park, then returns to Snowbird by 6:30 pm. Tour 2 includes stops at the dams and the Olympic Park, then drives on to nearby Park City for a leisurely visit and dinner on your own – returning to Snowbird by 9:30 pm.

Mountain Dell Dam is a John S. Eastwood multiple arch concrete slab buttress gravity structure 150 feet high and 560 feet long with sixteen 35-foot diameter arches. The dam was built in 1916, raised in

1926, and recently retrofitted to meet today's dam safety standards. The reservoir is six miles east of Salt Lake City and holds 3000 acre-feet of water for culinary use.

Little Dell Dam is a 209-foot high zoned embankment dam built in 1993 by the US Army Corps of Engineers for Salt Lake City Water Supply. The dam has a 72-inch outlet conduit containing a 42-inch pipe. The reservoir is 7 miles east of Salt Lake City and holds 20,000 acre-feet of water for culinary use. There is also a flood control and recreational component to the reservoir.

The Utah Olympic Winter Sports Park is 4 miles north of Park City and will host the 2001 Olympic bobsleigh, luge, ski jumping, Nordic combined, and skeleton competitions. During your one hour guided tour you will learn everything there is to know about the Park facilities, the athletes and sports represented, and the Park's role in the 2002 Winter Games.

For more information on Dam Safety 2001, see the ASDSO web site at <http://www.damsafety.org/conferences.cfm?content=annual>.

Additional information on the Corps meeting following the ASDSO meeting will be available around 15 July 2001.

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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ASDSO NEWSLETTER

ASDSO would like to offer the continuing opportunity for members of the Corps team to contribute dam safety news from the Corps of Engineers to their bimonthly newsletter. ASDSO is looking for short articles on new technology, research reports, publications, policy changes, legal cases or anything else that you think the ASDSO membership would be interested in.

The newsletter is distributed in January, March, May, July, September and November. Contributions for the newsletter should be sent to ASDSO, ATTN: Lori Sprapens, 450 Old Vine Street, Lexington, KY 40507. Additional information on preparing an article can be obtained by sending an email to info@damsafety.org.

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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NDSP SEMINAR - 2002 - RESPONDING TO DAM SAFETY EMERGENCIES

The topic for the next annual National Dam Safety Program Seminar will be "Responding to Dam Safety Emergencies." The seminar will be held 20-22 February 2002 at the National Emergency Training Center, Emergency Management Institute in Emmitsburg, Maryland. Districts interested in presenting papers at the seminar should contact their MSC Dam Safety Program Manager. Information on registration for the seminar will be posted as soon as it is available. Early registration is recommended since the 2001 seminar was sold out.

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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CALL FOR PAPERS FOR TAILING DAMS - 2002

Tailing Dams - 2002 is a joint Association of State Dam Safety Officials (ASDSO)/United State Society of Dams (USSD) specialty conference to be held in Las Vegas, Nevada, in May 2002. ASDSO has issued a called for papers for the conference with the following deadlines:

Abstracts Due: September 24

Abstracts Selected by: November 16, 2001

Selected papers due by: March 1, 2002

This conference will provide a forum for exchange of current strategies and procedures for design, permitting, operation, and reclamation of facilities for mill tailing and other hydraulically-placed mine waste materials. The conference is intended for those involved with the design, permitting, construction, operation, and closure of tailing facilities. The focus of the conference is the safety and stability of tailing facilities.

The conference is structured to have plenary sessions on topics of interest to all attendees. These will be followed by concurrent sessions of specific interest, organized in three areas: (1) metals, (2) coal, and (3) industrial minerals and non-metals. Suggested topics for papers to be presented at the conference:

Design. Embankment and drainage materials, embankment construction methods, liner systems, embankment stability and failure modes, water management systems, regulatory requirements.

Construction and Operation. Report on Operational Difficulties or Failures. Tailing discharge methods, water management techniques; fill placement and compaction issues, performance monitoring methods.

Closure and Reclamation. Post-operational drainage and settlement, geochemical issues, post-closure erosion and slope stability, reclamation methods, post-closure land use and performance monitoring.

Metals Tailing. Geochemistry and water quality issues, seismic and static stability, dealing with underground mine workings, liner construction and protection, tailing characterization and monitoring.

Coal Waste. Seismic and static stability, dealing with underground mine workings, geotextile performance, reclaiming coal fines.

Industrial Minerals and Non-Metal Tailings. Embankment slope stability, seepage or piping control, freeboard requirements, wave action protection, water quality issues, access control, vegetation management.

Prospective authors are requested to submit a brief abstract of the proposed paper to ASDSO by September 24, 2001. Abstracts should be 300 words or less. Submit abstracts to ASDSO, 450 Old Vine St., Lexington, KY40507; email to: info@damsafety.org or submit on-line at: <http://www.damsafety.org>.

POC: BOB BANK, CECW-EWW, 202-761-4243

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Information

CENTERS OF EXPERTISE

The Centers of Expertise list is still available on the Corps web site. It can be accessed through the Engineering and Construction Division homepage. On the homepage, click on "Centers of Expertise" in the list of Engineering Information of Interest. This will bring up the Centers of Expertise page. (Direct access address is <http://www.usace.army.mil/inet/functions/cw/cecwe/coexpert/index.htm>.)

When starting new work, engineering and construction elements are encouraged to contact the centers, specially when considering contracting design work with an Architect-Engineer firm. Often the Center will have an open-end contract available for use.

POC: BOB FITE, CECW-ET, 202-761-7169

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USACE ARCHITECT SELECTED FOR AIA POST

Mr. Lawrence P. Delaney, AIA, Chief Architect of U.S. Army Corps of Engineers (USACE), has been selected as the 2002 Vice-Chair of the American Institute of Architects Public Architects Professional Interest Area (PIA). The mission of the Public Architects PIA is to enhance the value of AIA through knowledge generation in improving the quality of public architecture and promoting the value of the Public Architect as an essential element in the planning, design, construction, and management of public facilities. Mr. Delaney will succeed Mr. Subrata Basu, AIA, AICP, Assistant City Manager/Planning Director for the City of South Miami as chair of the PIA in 2003.

POC: LAWRENCE DELANEY, CECW-E, 202-761-4945

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USACE ARCHITECT NAMED TO BOARD OF DIRECTORS

Mr. Lawrence P. Delaney, AIA, Chief Architect of U.S. Army Corps of Engineers (USACE), has been selected to represent the USACE, as a member of the Board of Directors for the Architecture, Construction and Engineering (ACE) Mentor Program of Greater Washington. The ACE Mentor Program is a not-for-profit corporation with the two-fold mission to (1) enlighten and motivate students toward architecture, construction, engineering and related careers, and (2) provide mentoring and scholarship opportunities for future designers and constructors. Initially established in New York City by a group of nationally prominent engineers the program has expanded to Washington (DC), Stamford (CT), New Haven (CT), Newark (NJ), Garden City (NJ), Geneva (IL), and Chicago (IL).

POC: LAWRENCE DELANEY, CECW-E, 202-761-4945

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JOB VACANCIES

The various districts and divisions continue to announce a large number of job vacancies each month. Team members who are interested in moving and changing positions within their current office are encouraged to visit the Army Civilian Career Program Web site at <http://www.cp18and55.net>. That site specializes in providing the registrants with up to date job vacancy announcements. This totally automated Internet based application is designed to free the user from continuously monitoring the Army CPOL vacancy announcement website. When CPOCs/CPOs send vacancy announcements to

the civilian personnel site at <http://www.cpol.army.mil>, this system selects and posts those announcements for the series, grade and locations identified. The system then automatically screens all registrants, matching geographical location, occupational series, pay plan and grade to the open job. Those registrants who match the position requirements are provided a weekly e-mail message notifying them of the match(es) found. Contact information is also provided with the match(es). To enroll in the system, click Register in the navigation menu and provide the required information.

The following Job Announcement is currently open:

Seattle District

Supervisory Interdisciplinary Engineer (GS-0808/0810/0830/0850-13) -- The Seattle District has announced recruitment for a Supervisory Interdisciplinary Engineer in their Engineering/Construction Division, NW Area Office, Fort Lewis Resident Office at Fort Lewis, Washington. The individual will be the Resident Engineer with direct responsibility for field and office engineering work associated with the construction program assigned to the Ft Lewis Resident Office. The work normally involves contract construction of family housing, barracks, medical clinics, administration and technical buildings, roads and streets and the like on military installations remote from the District Office; the work also involves Civil Works construction and restoration. Construction is performed under rigid completion schedules and a high degree of excellence is required. It involves novel construction methods and the use of nonstandard items, and entails multimillion-dollar expenditures. Supervises a staff of 10-25 professional, technical and administrative personnel in support of the construction function. Personally performs the more complex and controversial assignments. Professional Engineering Registration is required for this position.

Interested individuals should submit their RESUMIX to the West Region CPOC for inclusion in their inventory. If you have any questions regarding the RESUMIX system, please call our CPAC representative, Susan Smith-Anderson, at (206) 764-3738.

POC: RICK MOSHIER, CENWS-EC, 206-764-3776

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TDY ASSISTANCE NEEDED

The Far East District is in need of TDY assistance.

We need TDY assistance for our Pyongteak Resident Office (PRO). We are in need of a Project Engineer for approximately 60 to 90 days and an Office Engineer (engineer or engineer tech.) for approximately 60 days. The Resident Office is located at Camp Humphreys, which is approximately a 30-minute drive from Osan Air Base and a 1 1/2-hour drive from Seoul.

We would prefer a GS-12, however will consider GS-13's and experienced GS-11's. We are looking for the two individuals to arrive as soon as possible, but preferably no later than 15 July.

This is a great opportunity for someone who is considering working overseas and would like to experience a TDY assignment first just to "test the waters" before making their final decision. Working in the fast paced Far East District in Korea is a rewarding experience, both professionally and culturally.

Interested candidates should sent their resume by e-mail to the Resident Engineer Mr. Greg Reiff, greg.h.reiff@pof2.usace.army.mil with copies to Jack Church, jack.w.church@pof02.usace.army.mil, and Rod Markuten, rod.e.markuten@pod01.usace.army.mil.

*POC'S: JACK CHURCH, CEOPF-CD, 011-822-270-7250,
AND ROD MARKUTEN, CEPOD-CW-T, 808-438-9737*

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Upcoming Regional and National Meetings and Conferences

2001 INFRASTRUCTURE SYSTEMS CONFERENCE

The Engineering and Construction Division is sponsoring the Corps-Wide Infrastructure System Conference, to be held in the Reno Hilton Hotel, Reno Nevada, on 14-16 August 2001. The South Pacific Division and the Sacramento District are hosting the conference. The conference will be attended by design and construction engineers who be attending one of 5 workshops, Electrical-Mechanical Engineering, Structural Engineering, Geo-Technical Engineering, and Construction Engineering. In addition, there will be an industry show and exposition with approximately 100 organizations and vendors expected to participate. We expect to award up to 2.0 continuing educational units (CEUs) to each attendee. The conference will end on Thursday at noon; however on Thursday afternoon there will be separate engineering training sessions for those who are staying until Friday. Detail information on the workshop agendas is available on the conference web site: <http://gis.spk.usace.army.mil/2001isc/>.

We expect the conference to be a very informative and full 3 days. One of the major benefits is the sharing of lessons-learned experiences and networking with other design and construction professionals in a relaxed environment away from the everyday demands of the office. We encourage all Corps engineers who are in field of mechanical, electrical, structural, geo-technical, materials and construction engineering to attend. Spouses and guests are also encouraged to attend. Organized events are scheduled for them during the conference.

A block of rooms is available at the single and double occupancy rate of \$55 per night plus tax. Reservations should be made against "Room Block ACE01GT" NLT 10 July, by calling (800) 648-5080 or (775) 789-2536. Once individual reservations are made, please notify the Event Coordinator, Jim Truesdale at jtruesdale@spk.usace.army.mil, to confirm the reservation. There will be a \$200.00 registration fee for the conference. Checks should be made payable to "District Special Events" and mailed to U.S. Army Corps of Engineers, Sacramento District, ATTN: Jim Truesdale, Room 1224, 1325 J Street, Sacramento, CA 95814. If you have any questions, please check the web site or call Jim Truesdale at (916) 557-6823.

POC: ROBERT DIANGELO, CECW-ET, 202-761-55437750

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CII ANNUAL CONFERENCE

The CII Annual Conference will be held in San Francisco on August 8-9, 2001. Dwight Beranek would like to representatives from our E&C organizations to participate. The agenda and other information can be found at <http://www.construction-institute.org/ac2001/>. Please check this web site to determine if this conference would be of benefit to you in the performance of your job.

Internationally recognized as a leader in the research and development of improvements to the capital investment process, CII provides its Annual Conference attendees a unique opportunity to network with leaders from throughout the industry, to share research and implementation findings, and to listen to industry leaders discuss industry trends from a variety of perspectives.

Attendance is by invitation only, however, invitations can be arranged. Contact the POC listed below if you are interested in attending.

POC: JEAN MCGINN, CECW-EE, 202-761-7750

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21ST UNITED STATES SOCIETY OF DAMS ANNUAL LECTURE

The theme of the 21st USSD Annual Lecture is The Future of Dams and Their Reservoirs. A variety of contemporary issues facing the dam industry will be addressed during the Lecture, which will begin with a Plenary Session featuring keynote addresses by renowned geotechnical civil engineer Ralph B. Peck and David Olsen, President of the Coalition to Advance Sustainable Agriculture.

The Lecture will include concurrent sessions on the following topics:

- Life Extension Through Rehabilitation and Maintenance (LE)
- Optimizing the Use of Resources for the Needs of Society (OR)
- Decommissioning
- Design Considerations

More than 50 papers will be presented during the Tuesday and Wednesday concurrent Lecture Sessions, and a Poster Session. Continuing Education Units offered through Colorado State University will be available for meeting participants. Information on obtaining CEU's will be available at the meeting.

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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INTERNATIONAL WORKSHOP ON EMERGENCY PREPAREDNESS AT DAMS

The Federal Energy Regulatory Commission and the Association of State Dam Safety Officials are co-sponsoring an **International Workshop on Emergency Preparedness at Dams**. This two-day workshop will be held in the Niagara Falls, New York area during the week of September 24, 2001. We will also attempt to coordinate an on-site tour of a nearby dam or power plant facility.

At this workshop, we plan to gather representatives from the United States and other countries to share ideas and discuss improvements to emergency preparedness at dams. This workshop will provide a forum for dam owners, regulators, and emergency preparedness personnel. We hope to improve emergency preparedness at dams and dam safety programs within the United States and internationally.

In general, the structure of the workshop will be a "conference" type format. Speakers will present talks of approximately 45-minute length over a two-day period. At present, we are considering four general session topics:

1. Emergency Response (local/state response, FEMA/NEMA, international trends).

-
2. Dam Owner Responsibilities (problem detection, preparation of emergency plans and coordination).
 3. Advances in Technology.
 4. Future of Emergency Planning (panel/discussion format)

Please let us know as soon as possible if you are interested in attending the workshop or have any special topics of concern, or suggestions for the program. Also let us know if you, or a colleague, are interested in giving a presentation at the workshop. The workshop itself and all printed materials will be free to participants. No abstracts or papers are required, however copies of presentations will be published for distribution to attendees.

For further information and registration information, please contact Mr. Frank Calcagno via email at frank.calcagno@ferc.fed.us or at (202) 219-2741.

POC: BOB BANK, CECW-EWW, 202-761-4243

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WORKSHOP ON ROLLER-COMPACTED CONCRETE

A workshop sponsored by Portland Cement Association (PCA) will be conducted on 16 Aug (Thursday) from 1:00PM - 4:00PM at Reno Hilton, NV. Topics will include the following:

RCC in Water Resources Applications - Randy Bass, PCA
Design & Construction Trends for RCC Gravity Structures - Rod Holderbaum, Gannett Fleming
Designing RCC Hydraulic Structures: Spillways & Overtopping Protection - Terry Arnold, URS Corp
RCC Pavements: Design, Construction, and Performance by Jan Prusinski, PCA

Three hours of CEU will be offered to the participants. The workshop is free, thanks to PCA, and no registration is necessary. If you are planning to attend the FY01 USACE Infrastructure System Conference or just happen to be in Reno area on 16 Aug, don't miss this opportunity.

POC: M. K. LEE, CECW-EIV, 202-761-1518

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RESTORING STREAMS, RIPARIAN AREAS, AND FLOODPLAINS IN THE SOUTHWEST: IMPROVING LANDOWNER ASSISTANCE; INCORPORATING SCIENTIFIC ADVANCES

A workshop sponsored by U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, USDA Natural Resources Conservation Service, Bureau of Reclamation, and Little Colorado River MOM. The workshop Director will be Jon Kusler, Associate Director, Association of State Wetland Managers; and the Onsite logistics coordinator will be Wendy Blackwell.

The workshop is scheduled for October 29-31, 2001 at the Crown Plaza Hotel, Albuquerque, New Mexico.

This training workshop is primarily for a technical and semi-technical audience including federal, state, tribal, and local agency staff (stream, wetland, riparian area, land management, and watershed management), environmental not for profit organization staff, and academic staff and students. Landowners and others will also be welcome.

The principal goal will be to build state, tribal, local government, federal, and private stream, riparian, and floodplain capabilities to restore streams, riparian areas, and floodplains in the Southwest. The overall question for the workshop is: "How can the effectiveness of stream, riparian areas, and floodplain restoration be improved?" More specific goals include:

- Apply scientific advances to restoration,
- Improve landowner assistance,
- Build local, tribal, state, and federal restoration partnerships including US/Mexican cooperation and cooperation with Indigenous Peoples, and,
- Recommend mechanisms for cooperative restoration on public, private lands, and tribal lands utilizing the Little Colorado Watershed Multiobjective Management Effort and other efforts.

For more information on the workshop contact the Institute for Wetland Science and Public Policy, The Association for State Wetland Managers, P.O. Box 269, Berne, NY 12023-9746, 518-872-1804; Fax: 518-872-2171; E-mail: aswm@aswm.org. Please visit their website at <http://www.aswm.org> for updates on the agenda and speakers.

POC: BEVERLEY GETZEN, CECW-PD, 202-761-4489

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WETLANDS ENGINEERING & RIVER RESTORATION CONFERENCE 2001

The Wetlands Engineering & River Restoration Conference 2001 will be held August 27-31, 2001 at the Reno Hilton, Reno, Nevada.

As environmental contributions of functioning wetlands and riparian systems are increasingly recognized, local, state, and federal government agencies face ever-increasing demand to restore damaged systems. More restoration projects are underway than ever before, and the trend is likely to continue. Engineers & scientists are already working closely together to develop successful restoration designs for these complex ecosystems. However, many challenges remain.

This conference provides the unique opportunity for professionals in restoration fields to present work and learn from others, with a focus on inter-disciplinary approaches.

The last Wetlands Engineering & River Restoration Conference in 1998 was a huge success, with more than 1,000 attendees. We expect the 2001 Conference to be even more stimulating and successful!

Special Focus On...

- Wetlands Restoration and Creation
- Watershed Management
- River Restoration

For more information see the conference website at River Restoration:

<http://www.asce.org/conferences/wetlands2001/home.html>

POC: BEVERLEY GETZEN, CECW-PD, 202-761-4489

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DAM SAFETY 2001

The Association of State Dam Safety Officials (ASDSO) will hold their annual conference 9-12 September 2001 at Snowbird Resort, Snowbird Utah. See Article under the Dam Safety Section on this issue of the newsletter.

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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Training

MISSION TO THE S.T.A.R.S: LEADERSHIP FOR CRITICAL TIMES

This unique seminar is the result of a recent collaboration with the Space and Rocket Center and the Army Acquisition Corps, and is now being made available for the first time on an interagency basis. This dynamic seminar uses a simulated space emergency to immerse students in learning keyed to

- problem-solving
- accountability
- decisiveness
- resilience
- human resource management
- oral communication
- interpersonal skills

The program requires participants to work in teams, change behaviors and processes and experience how performance choices impact mission outcomes.

"This was hands-down the best government training class I have ever been to!" -a recent S.T.A.R.S. participant.

Two sessions: Sept. 10-11 and 12-13, 2001

Where: The Space and Rocket Center in Huntsville, Alabama

Additional sessions are planned for November

The countdown begins today: this seminar is offered on a first come, first served basis. To register call (304) 870-8008.

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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TERRORISM, ESPIONAGE, FOREIGN POLICY, AND NATIONAL SECURITY

Terrorism, Espionage, Foreign Policy and National Security: Four intriguing seminars from the National Policy Curriculum of OPM's Management Development Centers

Countering Terrorism Seminar -- Will tomorrow's terrorist simply be a more bloodthirsty version of today's, focused on big explosions and body counts? This one week seminar examines the threat of terrorism to U.S. security. The increasing number and ferocity of terrorist attacks have led U.S. officials to describe it as a "war". But it is a war that is changing even as it escalates.

Location: Eastern Management Development Center, Shepherdstown, WV

Dates: July 30-August 3, 2001

More details here: <http://www.leadership.opm.gov/np50.html>

Espionage in the Post Cold War World: A New Five Day Program -- Presented in conjunction with The Center for Human Reliability Studies, Oak Ridge Associated Universities

The recent arrest of FBI agent Robert Phillip Hanssen, accused of spying for the Russians for over 15 years, is the latest in a series of espionage cases that have been uncovered since the end of the cold war. Program participants will have an opportunity to discuss the major spy cases of the past decade with experts from the intelligence and counter-intelligence community, and will spend a day at a "mock" KGB Spy School under the instruction of former KGB Colonel Valentine Aksilenko.

Location: Eastern Management Development Center, Shepherdstown, WV

Dates: September 24-28, 2001

More details here: <http://www.leadership.opm.gov/espionage.html>

United States Foreign Policy -- This seminar provides a comprehensive perspective on the Administration's latest foreign policy initiatives and priorities. Participants examine foreign policy development at many levels and the interaction between Congress, the executive branch, and the principal federal agencies.

Location: Eastern Management Development Center, Shepherdstown, WV

Dates: August 6-17, 2001

More details here: <http://www.leadership.opm.gov/np63.html>

National Security Policy -- This seminar provides a strategic overview of the complex problems surrounding the creation and administration of national security policy. With guest faculty from government, academia, and private business sectors, participants explore the most compelling national security issues of our time and their interrelationship with U.S. foreign, military, economic, and domestic policy.

July 9-19, 2001 at the Eastern Management Development Center, Shepherdstown, WV

August 20-30, 2001 at the Western Management Development Center, Denver, CO

More details here: <http://www.leadership.opm.gov/np60.html>

These seminars are offered on a first come first served basis. To register call (304) 870-8008.

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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ENVIRONMENTAL POLICY ISSUES

Understand how we make Environmental Policy, why we make it the way we do, and how the policies are initiated and implemented. This seminar provides a framework for understanding the political, scientific, social, and economic issues that shape environmental policy. Participants will examine the Administration's environmental agenda, institutional policy roles, and the future direction of efforts to improve environmental quality.

Locations:

- ~Western Management Development Center (D)
- ~Eastern Management Development Center (S)

Dates:

- ~July 9-19, 2001 (S)
- ~September 17-27, 2001 (D)

Who Should Attend: Key program staff and managers at or above GS-13 or equivalent who are involved in policy development and program implementation in any area of U.S. national security. Field-grade military officers and above are strongly encouraged to attend.

Contact the Western Management Development Center today for space availability at 304-870-8008 or learn more about this seminar at <http://www.leadership.opm.gov/np52.html>

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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DYNAMICS OF PUBLIC POLICY

There is still space available for this essential seminar: Dynamics of Public Policy.

This seminar focuses on the political, social, economic, and cultural environment in which U.S. public policy is initiated, developed, and implemented. It examines the major policy-making institutions as well as non-governmental organizations whose dynamic interaction shapes policy. Participants acquire both background knowledge and practical experience through a highly interactive public policy simulation exercise.

Who Should Attend -- Managers and administrators at GS-14 and above or equivalent who are involved in the development and/or implementation of public policy or who are designated to serve in staff or liaison roles.

Dates -- August 6-17, 2001

Location -- Eastern Management Development Center, Shepherdstown, WV

Contact us today for space availability 304-870-8008 or learn more about this seminar at <http://www.leadership.opm.gov/np51.html>

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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LEADERSHIP COMMUNICATIONS WORKSHOP: INTERPERSONAL COMMUNICATION

This seminar teaches the theory and application of leadership and communication skills, and how to put them into practice. The result is to prepare the participant to lead colleagues in a changing world by communicating a vision. Executive Communication Skills combines practical knowledge of the key concepts of leadership with the interactive skills that are essential to communication.

Four key techniques make Executive Communication Skills work:

- *Video feedback
- *Custom-designed case studies
- *Small group coaching
- *Individual consultations with experienced faculty.

Who Should Attend -- Managers and executives who wish to improve their ability to influence others through improved communications.

Dates -- September 10-14 2001

Location -- Western Management Development Center, Denver, CO

Contact us today for space availability 304-870-8008 or learn more about this seminar at

<http://www.leadership.opm.gov/fs26.html>

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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Open Discussion and Comments

No items for discussion were received this month.

(Editors' note: If you want to share your thoughts with our readers regarding a subject of general interest, send an email to the E&C News editor at charles.pearre@usace.army.mil. A synopsis of your comments will be published next time).

Editors' Notes

FUTURE THEMES

For individuals wishing to submit articles for future issues of the Engineering and Construction News, the themes for the next three issues are shown below:

July 2001	Sustainable Design (Sustainability)
August 2001	Corps Water Management System (CWMS)
September 2001	Infrastructure Conference

The Districts of the Month will be as follows:

July 2001	Detroit District
August 2001	Walla Walla District
September 2001	Vicksburg District

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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SUBSCRIBE TO ECNEWS

Engineering and Construction News uses a subscription list on the Corps List Server. The name of the list is LS-ECNEWS. The purpose of the list is to distribute the Engineering and Construction community newsletter, *Engineering and Construction News*.

You can subscribe or unsubscribe to LS-ECNEWS by sending an e-mail message to majordomo@ls.usace.army.mil with no subject line and only a single line of text in the message body. That single line of text should have the following format: **subscribe ls-ecnews** or **unsubscribe ls-ecnews**. The List Server system will automatically pick up your originating e-mail address from the message and add it to or delete it from the distribution list.

If you have any questions about the list server, see the List Server E-Mail Delivery System web page at <http://eml01.usace.army.mil/other/listserv.html>. Or you may contact Charles Pearre if you have additional questions on the subscription list.

POC: CHARLES PEARRE, CECW-EIS, 202-761-4645

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